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DAVID S. ROSENZWEIG
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January 14, 2004

Mary L. Cottrell, Secretary
Department of Telecommunication and Energy
One South Station, 2nd Floor
Boston, MA 02110

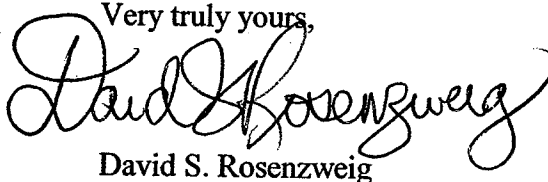
Re: Boston Edison Company, D.T.E. 03-112

Dear Secretary Cottrell:

Enclosed please find the response of Boston Edison Company d/b/a NSTAR Electric ("Boston Edison" or the "Company") to record request AG-1 in the above-referenced proceeding.

Thank you for your attention to this matter. Please contact me at your convenience if you have any questions relating to this filing.

Very truly yours,



David S. Rosenzweig

Enclosures

cc: Kevin Penders, Hearing Officer
Joseph Tiernan, Electric Power Division
James Byrnes, Rates Division
Colleen McConnell, Assistant Attorney General
Bryant K. Robinson
Neven Rabadjija, Esq.
Stephen J. Carroll
Tam Ly

Boston Edison Company d/b/a NSTAR Electric
Department of Telecommunications and Energy

D.T.E. 03-112

Record Request: **AG-1**

January 14, 2004

Person Responsible: Bryant K. Robinson

Page 1 of 1

Record Request AG-1

Please provide a copy of the environmental studies referenced in Exhibit NSTAR-DTE-1-6(c)(Att).

Response

Please see Attachment RR-AG-1.

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OFFICES IN CHICAGO
AND WASHINGTON, D.C.

May 27, 2003

VIA UPS AIR SECOND DAY

NSTAR
Doug Horan, Esq.
General Counsel
Corporate Headquarters
800 Bolyston St.
Boston, MA 02199

Dear Mr. Horan:

I have been retained by a group of citizens regarding the impending sale of the Boston Edison Property located between Vine, LaGrange and Brookline Streets in Newton, Massachusetts ("NSTAR Property"). I have included my clients' names as an attachment to this letter. This land has been documented as the habitat of Endangered, Threatened, and Species of Special Concern under the Massachusetts Endangered Species Act.

Please note that the Massachusetts Endangered Species Act prohibits any "taking" of a species listed on the Massachusetts List of Endangered, Threatened and Special Concern Species. A taking includes any disruption of the nesting, breeding, feeding or migratory activity of listed animals, and any collecting, picking, killing, transplanting, cutting or processing of listed plants. Unauthorized takings of listed species result in severe penalties under the Act, including fines up to \$10,000 per each individual species affected and up to 180 days imprisonment.

Attached for your review are two environmental studies demonstrating that listed species have been observed on this land - "Plant Inventory and Wildlife Habitat Assessment; Boston Edison Property - North Parcel" Rimmer Environmental Consulting, 1997, ("1997 Report"), and "Saw Mill Brook Conservation Area" John P. Richardson, 1995, ("1995 Report"). The 1997 Report was conducted on a single day in September; the 1995 Report included observations in the months of August through November. To our knowledge, a study has not yet been conducted that observes the land during each season. The studies have noted that further research and observation is in fact necessary.

The following protected species have been observed or are believed to be present on the land: Northern Harrier (*Circus cyaneus*) (1997 Report, p. 6), Eastern Timber Rattlesnake (*Crotalus horridus*) (1997 Report, p. 6), Elderberry Stem Borer Beetle (*Desmocerus palliatus*) (1997 Report, p. 7), and Northern Parula (*Parula americana*) (1995 Report, p. 8). Attached for your review are fact sheets from the Massachusetts Division of Fisheries and Wildlife, Natural

Heritage and Endangered Species Program, presenting the reasons for these species' decline and highlighting the importance of conserving these species' habitats.

The Eastern Timber Rattlesnake is listed as "endangered" under Massachusetts law, meaning that this species of snake is in danger of extinction throughout all or a significant portion of its range and is in danger of extirpation (extinction in the state of Massachusetts). Its habitat is generally remote mountainous terrain characterized by second growth deciduous or coniferous forest, steep ledges and rock slides, and a high rodent population. Members of this species are also found in pine barrens and wetlands near mountains, quarries, old stone walls, and abandoned buildings and occasionally in fields and pastures. The active season of the Timber Rattlesnake in Massachusetts runs from mid-April to mid-October. The Timber Rattlesnake is classified as an endangered species because of its rarity and declining population in the state. Historically, this species was widespread throughout the state, with 21 occurrences recorded in 22 locations. However, since 1978, only 12 sightings in 10 locations have been documented. Destruction of rocky, wooded habitat, excessive removal by collectors, and mortality at the hands of snake hunters and the general public have endangered the species to the point of near-extinction. The Massachusetts Natural Heritage and Endangered Species Program has recognized that the Timber Rattlesnake is put at risk by construction and development, although its habitat is often underground. Roads also pose a risk to the species due to mortality in crossing. The 1997 Report, conducted on a single day so admittedly deficient in terms of the times of observance, observed a skin belonging to the Eastern Timber Rattlesnake on the property. (1997 Report, p. 6). Further investigation is clearly required in order to determine the rattlesnake's habitat on the land and to take steps to safeguard its habitat, as noted by the biologists who spotted the skin. (1997 Report, p. 6).

The Northern Harrier and the Northern Parula are listed as "threatened" under Massachusetts law, meaning both species are likely to become endangered species within the foreseeable future. Northern harriers have been reported to be on the property. (1997 Report, p. 6). The most significant factor in the Northern Harrier's decline has been the destruction of suitable habitat by reforestation of agricultural land and destruction of coastal and freshwater wetlands. In order to prevent further decline in the Northern Harrier's population, it is crucial to protect suitable habitats from development and destruction.

The Northern Parula has been observed on the property, as well. (1995 Report, p. 8). The Northern Parula has experienced a steady decline in Massachusetts. Since 1978, only nine breeding locations have been recorded in the state. By 1986, the Parula was known to breed in only four locations. To date, it is believed that the number of breeding pairs has dramatically declined, with only one remaining known breeding location where as few as 5 breeding pair remain. The species thus faces the serious threat of extirpation in Massachusetts. The reasons for its decline are unknown, but the destruction of its habitat through deforestation and development is a significant factor in the decline of the species.

The Elderberry Stem Borer Beetle, also known as the Elderberry Long-Horned Beetle, is listed as a species of "special concern", meaning it has suffered a decline that could threaten the

NSTAR
Doug Horan, Esq.
May 27, 2003
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species if allowed to continue unchecked or that occurs in such small numbers or with such a restricted distribution or specialized habitat requirements that it could easily become threatened within Massachusetts. The 1997 report conducted by Rimmer Environmental Consultants, however, confirms that the beetle is likely to occur on this site based on tree borings. (1997 Report, p. 4; 7). Further, the Report states that the presence of this beetle on the land was confirmed by personal communication with Tim Simmons of the Massachusetts Natural Heritage and Endangered Species Program. (1997 Report, p. 7). Unfortunately, this study was conducted during a single day in the month of September; Elderberry Stem Borer Beetles are traditionally observed between mid-June and mid-July. The reasons for its decline in the state of Massachusetts are unknown and it has only been reported as observed in the state from four towns since 1978. Obviously, this beetle is quite rare and the preservation of its habitat is of the utmost importance.

The 1997 report, commissioned by the government and conducted by professional biologists, concluded that more study is necessary under the Act to protect these endangered, threatened and special concern species. The exact location of these protected species' habitats on the NSTAR property is not known at this time due to the short time frame in which the studies were conducted and the lack of further research. However, we do know that an elderberry tree is present in an approximately 500 square foot area of isolated wet meadow along LaGrange Street and it contains hollow branches which may have been created by the Elderberry Long-Horned Beetle. (1997 Report, p. 4). Further investigation is necessary to determine if other trees are hosts to the Beetle, as well as the determination of the exact location of the other species' habitats.

Additionally, as you know, wetlands are also present and extensive on the land; we understand that no building will interfere with the wetlands.

We are very interested in working with NSTAR to achieve protection of all listed species on the NSTAR property. We desire that all prospective purchasers are notified of liabilities on the site, including penalties under the Massachusetts Endangered Species Act and the possibility that the site may be designated as a Significant Habitat by the Massachusetts Division of Fisheries and Wildlife. State and federal agencies have been notified of the proposed development, including the United States Fish and Wildlife Service, the Massachusetts Division of Fisheries and Wildlife, the Massachusetts Audubon Society and Sierra Club.

We urge you to join us in the conservation of Massachusetts' endangered species and to ensure that future generations will be able to enjoy the natural state of your land, including the preservation of endangered and threatened species' habitats.

Sincerely,



Neal H. Weinfield

NSTAR
Doug Horan, Esq.
May 27, 2003
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cc: City of Newton
United States Fish and Wildlife Service
Massachusetts Division of Fisheries & Wildlife
Massachusetts Department of Environmental Protection
Massachusetts Audubon Society
Sierra Club
Environmental League of Massachusetts
Green Corps
Massachusetts Association of Conservation Commissions
Massachusetts Public Interest Group
The Trustees of Reservations
Boston Globe
Boston Herald
Boston Magazine
Newton Graphic
Newton Citizens Group re: NSTAR Property
Sara K. Orr, Esq.

Newton Citizens Group re: NSTAR Property

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Natural Heritage &
Endangered Species
Program

Commonwealth of Massachusetts
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Route 135
Westborough, MA 01581
(508) 792-7270

ENDANGERED SPECIES OF MASSACHUSETTS

Timber Rattlesnake
(*Crotalus horridus horridus*)

DESCRIPTION: Rattlesnakes belong to the family of snakes known as pit vipers. Like other reptiles, they are vertebrates (they have backbones) and they are ectothermic (they cannot control their body heat by physiological means and must move to a warmer or cooler environment to control their body temperature). The term "pit viper" derives from the characteristic loreal pits. There is one pit on each side of the head, lying midway between the nostril and eye but below their level. Each pit contains sensitive nerve ends that react to radiant heat. The primary function of these sensory units is to assist the snake in detecting warm-blooded prey in darkness. The head of a pit viper is broad and triangular. The neck is comparatively thin relative to the body. The eyes have vertically elliptical (catlike) pupils. There are no movable eyelids or external ear openings. Sight is fairly keen within a limited range; moving objects are perceived more readily than stationary ones.

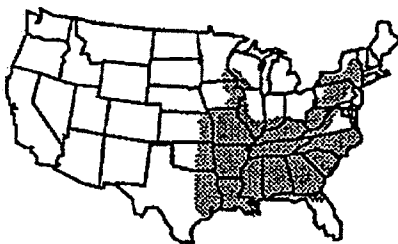
The Timber Rattlesnake is extremely sensitive to ground vibrations and can detect very slight ground disturbances. These vibrations are transmitted to the auditory nerve through the bones of the lower jaw.

Its tongue is not a stinger but a very delicate organ associated with a pair of cavities, known as Jacobson's organ, located in the roof of the mouth. The tongue reaches out and brings in particles from the air. The Jacobson's organ appears to be directly related to the nasal system and aids in smelling; however, each system can be used independently as well as together.

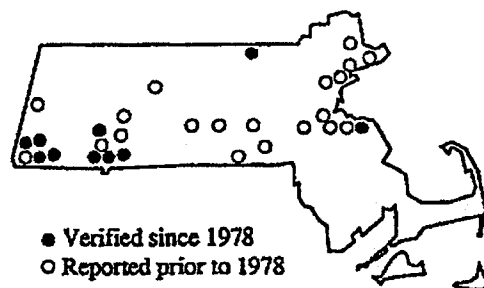
This species has two well-developed and enlarged venom conducting fangs, located at the front of the mouth and secured to the upper jawbone. The fangs are movable and fold against the roof of the mouth when not in use. A fleshy sheath covers each fang when the mouth is closed. The fangs are not permanent; they are shed periodically.



DeGraaf, Richard M. and Rudis, Deborah D.
Amphibians and Reptiles of New England,
Amherst, Massachusetts: The University of
Massachusetts, 1983.



Range of the Timber Rattlesnake



Distribution in Massachusetts

Each fang socket has several replacement fangs in various stages of development, located in the gum behind the functional fang. Before a fang is shed, a new one is already positioned. Each fang is connected internally to a venom gland. Through muscular action, venom is forced from the gland through a venom duct to the hollow fang and then into the victim. In addition to these enlarged fangs, pit vipers have many curved smaller teeth on the palate and lower jaw.

Color patterns in the Timber Rattlesnake are extremely variable; some individuals are almost jet black, while others are sulphur yellow with black, brown, or rust-colored blotches separated by crossbands on the back and sides. Southern populations have a chestnut stripe down the back. This species is distinguished from other North American species of rattlesnakes by a lack of stripes or bands on its head and face, and a solid black tail.

The Timber Rattlesnake, like all rattlesnakes, has a unique structure at the tip of its tail that, when vibrated, makes a rattle-like sound. Though the number of rattles, especially in free-ranging snakes, is variable there is usually at least one or two. A new rattle segment is added each time the rattlesnake sheds its skin. In natural situations, this occurs three or four times during the warmer months and is necessary for healthy growth. The approximate age of the snake can be determined only if the snake still has a prebutton with which it was born.

The Timber Rattlesnake has keeled scales (i.e., a ridge protrudes from the middle of each scale) giving the snake a relatively rough-skinned appearance. The adult measures 90-152 cm (36-60 in) in length; the newborn young usually 20-41 cm (8-16 in). Males usually have longer tails, but there is no reliable external cue to differentiate the sexes.

SIMILAR SPECIES IN MASSACHUSETTS: There are only three Massachusetts snakes that have dorsal (back or upper side) blotches, saddles, or bands - The Timber Rattlesnake, the Northern Water Snake, and the Milk Snake - and they all have different venters (belly or under side). The Timber Rattlesnake is almost uniformly light below with just a little dark flecking; the Eastern Milk Snake (*Lampropeltis triangulum*) has a distinctive black and white checkerboard pattern; and the Northern Water Snake (*Nerodia sipedon*) has reddish and black crescents. Like the Timber Rattlesnake, the Milk Snake will vibrate its tail rapidly when disturbed and, among dry leaves, this can produce a rattling sound.

The Northern Copperhead (*Agkistrodon contortrix*) is the only other pit viper in Massachusetts, but it is more reddish brown with an hour-glass pattern on its body. Though it does have a facial pit, its head is narrower and less triangular. The dark phase of the Eastern Hognose Snake (*Heterodon platyrhinos*) superficially resembles the dark phase of the Timber Rattlesnake, but it has a fat head and a distinctive, sharply-upturned snout.

RANGE: The range of the Timber Rattlesnake is from southern New Hampshire, the Lake Champlain area to southwestern New York, west along the Ohio River Valley and north to the Mississippi River in Wisconsin. It extends to northern Texas, southern Illinois, northern Georgia and through the Appalachians to New Jersey. There are isolated colonies on Lake Erie Island, southern Ontario, southeastern New England, and north central North Carolina.

HABITAT IN MASSACHUSETTS: The Timber Rattlesnake prefers remote mountainous terrain characterized by second growth deciduous or coniferous forest, steep ledges and rock slides, and a high rodent population. In the ledges are fissures and crevices that, presumably, lead to subterranean caverns. It is believed that the rattlesnake hibernates in these deep caverns. The entrances to the hibernacula (den) have southern, southeastern, and southwestern exposures, allowing the rattlesnake to sun itself in the spring and fall. Scattered concentrations of large and small shelving rock slabs normally cap the top and surround the sides of rattlesnake dens.

Members of this species are sometimes found in pine barrens and wetlands near mountains, quarries, old stone walls, and abandoned buildings; may occasionally be found in fields and pastures. A supply of water is always nearby. A common feature of their habitat is remoteness; it seems that either they avoid areas frequented by people, or have been eliminated in densely populated areas.

LIFECYCLE/BEHAVIOR: In Massachusetts, the active season of the Timber Rattlesnake runs from mid-April to mid-October. Beginning in mid-April, the rattlesnake emerges from hibernation and begins basking on ledges during the day. It lingers in the area for several weeks. The Timber Rattlesnake can be found sunning itself regularly, often in the same spot, with other rattlesnakes or other species nearby. There is little movement or feeding early in the spring and the snakes often appear lethargic. The population is concentrated in and around the hibernaculum with some courtship and mating taking place.

Timber Rattlesnakes are known to mate both in the spring and autumn. Males seem to be particularly active during courtship and are able to track females by a pheromone the females leave behind. Courting males attempt to crawl along the length of the female and may engage in some chin rubbing. The pair may crawl over each other's bodies several times. If the female is ready to mate, she will lift the rear part of her body and tail off the ground slightly allowing the male to maneuver his tail around and under hers. The duration of actual mating is unknown.

After mating, most of the males and at least some of the females begin to migrate up to two or three miles from the den site. There is some question as to whether the snakes actually set up summer feeding territories or if they continually move in a large, oval route that brings them eventually back to the den site early in the fall. In the summer, female Timber Rattlesnakes appear to prefer open forest or edges of fields where temperatures are higher than in surrounding locations. Males, on the other hand, seem to linger in thicker woods where the forest canopy is more completely covered.

In northern latitudes and at the higher elevations where Timber Rattlesnakes are found, females give birth only every second or third year. Because gravid (pregnant) females generally fast for the summer and have little opportunity to eat in the autumn after giving birth, they may be under physical stress for some time and must use the next active season to restore their bodies.

The male and female Timber Rattlesnake reach sexual maturity at five months and six to seven months, respectively, with an estimated life span of 10-15 years. Breeding typically takes place in the spring but sometimes may occur in September or October. The gestation period is 4-5 months. The Timber Rattlesnake is ovoviviparous (their young are born alive). The birth process involves the female rattlesnake lifting her tail and the young are extruded, usually one at a time, within a minute or two of each other. Each snakelet is born enclosed in a membranous fetal sac. The young snake ruptures the sac using a tiny, sharp egg tooth situated just inside the mouth in front of the upper jaw. Five to nine young, measuring 20-25 cm (8-10 in) in length, are born sometime between late August and mid-September. The mother does not care for her young. Each of the young is equipped with venom, fangs, and a single, tiny rattle segment called a button. In addition, they are born with a supply of egg yolk in their abdominal cavities. The young, nourished by this egg yolk, grow rapidly during their first few weeks. The snakelets remain near each other for a week or two and then shed their skins. Following this, the young have a tendency to move away from where they were born.

Newborn rattlesnakes have a velvety texture, though their pattern is essentially the same as that of the adult. Some newborns have a rust-colored stripe extending from head to tail along the middle of the back. The body color as well as the head is generally dark or light grey. Because the snakelets are born in late summer, they must find suitable overwintering sites relatively quickly. Studies have shown that the newborn Timber Rattlesnakes are able to detect the odors left by their mother or siblings, and with no former knowledge of the distance and direction of a wintering den site, may actually follow a trail left by their mother to the wintering den.

The Timber Rattlesnake feeds almost entirely on warm-blooded rodents, such as mice, voles, squirrels, shrews, and chipmunks, although it occasionally eats birds. Like all snakes, this species swallows its food whole. Drinking water is also needed by this species. During the spring and in the autumn, the Timber Rattlesnake hunts mainly by day as night temperatures are too low for normal activity. As the weather warms in the early summer, the rattlesnake changes its diurnal hunting to nocturnal activity. This change has several advantages: the snake avoids the intense heat of the day, and the possibility of capturing prey is considerably better because rodents and amphibians are more active at night.

The typical hunting behavior of the Timber Rattlesnake consists of long periods of lying motionless, with intervals of prowling. The snake captures its prey by sitting quietly for some time and then ambushing its prey when it moves within striking distance. Timber Rattlesnakes attempting to feed in this manner coil their bodies next to a fallen log and rest their heads or chin on the edge. The prey is detected by sight, scent, and the sensory pit which can detect the heat radiating from a warm-blooded animal. Thus guided, the snake strikes out at its prey and sinks its venom-conducting fangs into the prey. Usually it then recoils and waits for the venom to overcome the victim. After a strike, the rattlesnake uses its sense of smell to track the victim. The length of time before the prey dies depends largely on the size and kind of prey and the amount of venom injected. The venom serves two important functions. In addition to being the killing agent, it contains enzymes that break down the victim's body tissue and aid in digestion.

The use of the venom as a defensive weapon is secondary. Their defensive actions are largely determined by the degree of intrusion and the accessibility of a refuge. As snake will resort to striking and biting only as a last resort - generally only when it has been cut off from retreat or when actually seized. Even when pushed to the limit, venomous snakes rarely use their poison to the fullest extent. The Timber Rattlesnake is not boldly aggressive. In the field, this species tends to be nervous and high-strung and will quickly seek shelter if approached. The last human fatality from a Timber Rattlesnake bite in Massachusetts was in 1791.

POPULATION STATUS IN MASSACHUSETTS: The Timber Rattlesnake is classified as an Endangered Species in Massachusetts because of its rarity and declining population. Historically, this species was widespread throughout the state, with 21 occurrences recorded in 22 locations. Since 1978, only 12 sightings in 10 locations have been documented. Destruction of rocky, wooded habitat, excessive removal by collectors, and mortality at the hands of snake hunters and the general public imperil the Timber Rattlesnake.

MANAGEMENT RECOMMENDATIONS: If it were not for the existence of public lands both on the state and national level (national and state parks, national forests, state forests) and of privately-owned nature preserves, much of the remaining habitat of the Timber Rattlesnake would have been destroyed. Thus, taking steps to increase public land holdings in prime Timber Rattlesnake habitats through a variety of purchase or conservation easement mechanisms is an important conservation strategy for this species. Individual rattlesnakes have been known to move as far as 7.2 km (4.5 mi) from their den and the maximum migratory distance averages 4.0 km (2.5 mi) for males. This data substantiates the need for 2.4 km (1.5 mi) of protected land in all directions from a den.

In addition to land protection, management recommendations to safeguard known populations would be as follows:

1. Protecting the snake at its known denning colonies through vigilance;
2. Fencing in special situations to limit access of private property by rattlesnakes;
3. Maintaining a level of secrecy regarding the localities of den sites; sightings should be reported to state Natural Heritage Programs;
4. Avoiding behavioral disturbance of the snakes by restricting access to dens and nursing areas;
5. Patrolling the area during vulnerable times, particularly (a) the spring emergence period and (b) the summer gestating and birthing periods;
6. Enhancing habitat by vegetation thinning or removing large trees at some den sites to prevent shading over and to maintain a somewhat open habitat ;
7. Develop methods of re-establishing populations at historic den sites;
8. Limiting logging within the summer range of a rattlesnake population to the winter months;
9. Educating the public with biologically accurate information and working with local residents to promote understanding of the Timber Rattlesnake as a beneficial native species of the deciduous forest community (Tynning, 1978).

Due to the location of preferred habitat, the denning sites are rarely effected by construction-type development but the Timber Rattlesnake is put at risk by construction and development nearby. Roads also place this species at risk due to mortality in crossing.

The Timber Rattlesnake is one of two species, (the other being the Northern Copperhead), that is affected by direct intentional persecution; they are killed out of deep rooted sociological fear. Too frequently, a Timber Rattlesnake coiled quietly in its natural habitat is a target of wanton killing and the snake has been heavily persecuted by bounty hunters and collectors for the live animal trade (Tynning, 1978). This species is currently listed as an "Endangered Species" in Massachusetts and is protected under law. Educating the public sector about the Timber Rattlesnake and the laws protecting it are critical to the long-term survival of the species. The most important means of protection for this species is law enforcement.

Partially funded by a grant from DEM Forest Stewardship Program

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Natural Heritage &
Endangered Species
Program

Commonwealth of Massachusetts
Division of Fisheries & Wildlife
Route 135
Westborough, MA 01581
(508) 792-7270 ext. 200

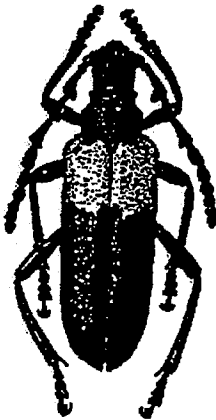
MASSACHUSETTS SPECIES OF SPECIAL CONCERN

Elderberry Long-horned Beetle
(*Desmocerus palliatus*)

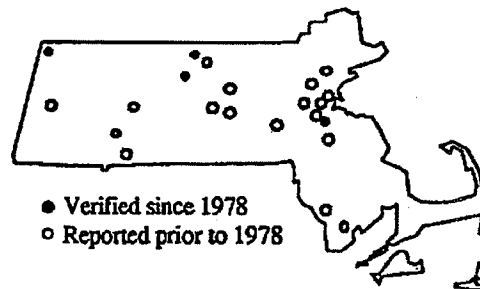
DESCRIPTION: The Elderberry Long-horned Beetle is one of the most striking beetles found in Massachusetts. It is a member of the family Cerambycidae, or long-horned beetles. The entire body is a dark metallic blue except for the anterior third of its outer wing, which is bright gold or orange in color. It is approximately 25 mm. (1 in.) long and 7 mm. (0.3 in.) wide. The antennae of the male extend to the hind third of the wing. Those of the female extend to the middle of the wing. The antennae of both sexes are characterized by a thickening at the end of the middle segments earning the species its alternate name "Cloaked Knotty-Horn Beetle".

SIMILAR SPECIES: The Elderberry Long-horned Beetle is not easily confused with any other beetle species in Massachusetts. Its relatively large size and distinctive bright coloration are excellent field marks.

RANGE: The Elderberry Long-horned Beetle is found throughout the northeastern half of the United States and parts of eastern Canada. It is known from Massachusetts and Connecticut south to Virginia and North Carolina and west to Indiana and Kansas. In Canada it has been found in Ontario.



Dillon and Dillon. The Common Beetles
of Eastern North America. 1972.



Massachusetts Distribution by Town

ECOLOGY/LIFE HISTORY: The flight period of adult Elderberry Long-horned Beetles in Massachusetts is known to extend from at least June 5 to August 9. Most observations of adults have been made between mid-June and mid-July. Adults nearly always occur in close association with elderberry bushes (*Sambucus* spp.), where they are usually found on the leaves or flowers. The eggs are laid on the leaves or stems of elderberry. After hatching, the larvae bore into the stems of the host plant and create long burrows running along the axis of the stem. The larvae of the Elderberry Long-horned Beetle are a creamy white color with a brown head and black mandibles. When full grown, the larvae are approximately the same length as the adults. It should be noted that larvae of the Elder Shoot Borer Moth (*Achatodes zeae*) also bore into the stems of elderberry bushes. Larvae of both the beetle and the moth may kill individual shoots of the elderberry by their feeding activities.

POPULATION STATUS IN MASSACHUSETTS: The Elderberry Long-horned Beetle was formerly widespread in Massachusetts but there are only a few recent records confirming its continued existence in the state. It was documented historically from at least 22 towns, but has been reported from only 4 towns since 1978. The reasons for its apparent decline are unknown. The Elderberry Long-horned Beetle is currently listed as a "Species of Special Concern" in the state.



Natural Heritage & Endangered Species Program

Commonwealth of Massachusetts
Division of Fisheries & Wildlife
Route 135
Westborough, MA 01581
(508) 792-7270 ext. 200

MASSACHUSETTS THREATENED WILDLIFE

Northern Harrier (*Circus cyaneus*)

DESCRIPTION: The Northern Harrier or Marsh Hawk is a slim, long-legged, long-tailed hawk, about 40 to 60 cm (16 to 24 in.) in length, with an owl-like face and long, rounded, narrow wings extending up to 1.2 meters (46 in.) from wing tip to wing tip. Males are pale bluish gray on the head and upper surface, white on the undersurface, and have black wing tips; the tail has a broad subterminal bar with 5 to 7 narrower dark brown bars. Females are dusky brown on the head and upper surface, and light brown with darker vertical streaks on the lower surface; the tail is dark in the center, becoming paler near the outer edges, and has 5 to 7 broad brown bars. Both sexes possess a conspicuous white rump patch, white upper tail coverts, light orange-yellow legs, and black bills. Northern Harriers have large ear openings, but they are usually hidden underneath their feathers.

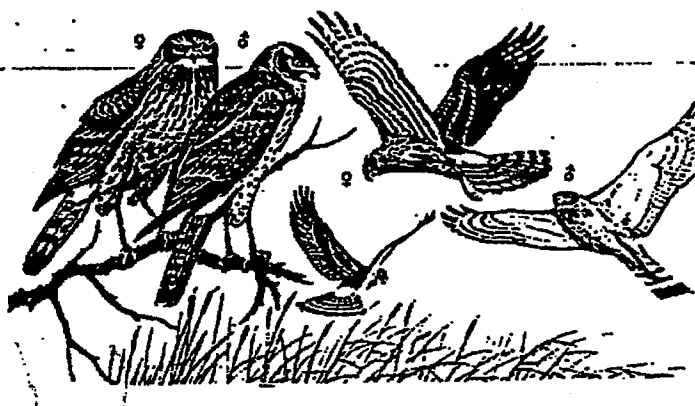
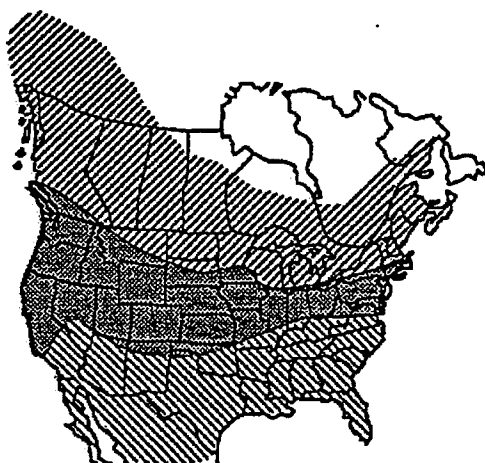


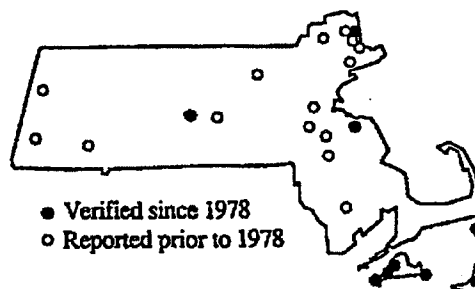
Illustration by Arthur Singer, from Robbins, C.S., Bruun, Bertel, Zim, Herbert. *Birds of North America*. Golden Press, NY 1966

SIMILAR SPECIES IN MASSACHUSETTS: The male Northern Harrier's gray coloration makes it distinct from other local birds. However, the female Northern Harrier vaguely resembles the Short-eared Owl (*Asio flammeus*); both occupy the same habitat type, have a brownish upper surface and white breast with vertical brown streaks, long rounded wings and black wingtips. However, the Short-eared Owl is smaller, with short feathered legs, a white facial disk, and lacks the bright white rump patch possessed by Northern Harriers.



Range of Northern Harrier
 Summer (breeding) range
 Year-round range
 Winter range

RANGE: The Northern Harrier breeds from Massachusetts north to Newfoundland and Alaska, south to southeastern Virginia, and west to northern Texas and central California. Wintering range extends from New England west to southern British Columbia and south into Central America and the West Indies.



Massachusetts Distribution by Town
1990

HABITAT IN MASSACHUSETTS: Northern Harriers establish nesting and feeding territories in wet meadows, grasslands, abandoned fields, and coastal and inland marshes, mostly along the coast. Northern Harriers in Massachusetts are uncommon summer residents or migrants, although they once were much more abundant in the state. Most Harriers in the state which do not migrate south spend the winter in coastal marshes on Cape Cod and the offshore islands. Some Northern Harriers that breed in areas north of Massachusetts may also spend the winter on the offshore islands and along the coast. Northern Harriers are known to share habitat and territory with Short-eared Owls.

LIFE CYCLE / BEHAVIOR: The breeding season of Northern Harriers extends from March to July in Massachusetts and is initiated by a spectacular courtship ritual called skydancing, which is usually performed only by males and is used to attract mates. A skydancing Northern Harrier performs an aerial acrobatic display of dives, somersaults, loops, and tumbles, often accompanied by shrill screaming calls.

Once the male has found a mate, the female Northern Harrier builds a nest made of grasses, weeds, water plants, and other vegetative material supplied to her by her mate. The nest is usually located in a slight hollowed-out area on the ground, among bushes, grasses, and other low vegetation, and consists of a thick pad of grasses surrounded by dry stalks of plants, weeds, and small twigs. Sometimes the nest is built over shallow water on a raised mound of sticks, hollowed in the center and lined with dry grass, stubble and weed stalks.

After courtship and mating have occurred, the female lays from 2 to 9 bluish-white eggs (3 to 6 on average), about 1 egg every other day. Both parents help incubate the eggs until they hatch 30 to 32 days later. The male Harrier provides all the food to his mate and young until they fledge 30 to 35 days after hatching. Although Northern Harriers are known to readily abandon nests when disturbed before the eggs hatch, they vigorously defend their nests once their young have hatched. After the young have fledged, they may hunt together with their parents through the remainder of the summer, until they disperse on their own or are driven off. The Northern Harriers which do not spend the winter in Massachusetts begin to migrate south in late August or early September.

Northern Harriers prey on a variety of small creatures, including rodents, rabbits, and other small mammals, small birds, insects, amphibians, reptiles, and carrion. In Massachusetts, voles constitute a very important component of the Harrier's diet; there is a direct correlation between the breeding success of Northern Harriers and the number of voles found in their territory. When hunting, the Northern Harrier flies low over the ground, slowly and systematically, usually in early morning and late afternoon or early evening. When it detects prey, it hovers a moment before swooping straight down to the ground. The Harrier uses its talons to capture prey and then kills its catch via repeated stabs with its sharp beak.

POPULATION STATUS IN MASSACHUSETTS: The Northern Harrier is listed as a Threatened Species in Massachusetts, with 26 current (post-1978) breeding sites and 16 historical breeding sites. The Northern Harrier was once a common breeder throughout Massachusetts from the mid-1800's to the early 1900's. Today, almost all of the breeding Harriers in the state are confined to the offshore islands, Cape Cod, and Plum Island.

The most significant factor in the Northern Harrier's decline has been destruction of suitable habitat by reforestation of agricultural land and destruction of coastal and freshwater wetlands. In coastal areas, human disturbance may cause some Harriers to abandon their nests. Natural factors such as prey abundance, prolonged periods of rain (which may destroy nests and eggs), and predation on eggs and nestlings all affect the breeding success of Northern Harriers. In order to prevent further decline in the Northern Harrier's population, it is crucial to protect suitable habitats from development and destruction.

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Natural Heritage &
Endangered Species
Program

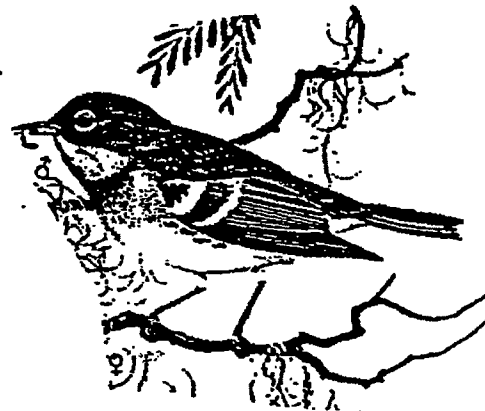
Commonwealth of Massachusetts
Division of Fisheries & Wildlife
Route 135
Westborough, MA 01581
(508) 792-7270

THREATENED SPECIES OF MASSACHUSETTS

Northern Parula
(*Parula americana*)

ETYMOLOGY: The name "parula," (pronounced PAR-u-la, PAR-ya-la, or PAR-you-la) means "little titmouse" and is the diminutive of "parus," the genus of titmice and chickadees, which the Northern Parula resembles in some of its behaviors.

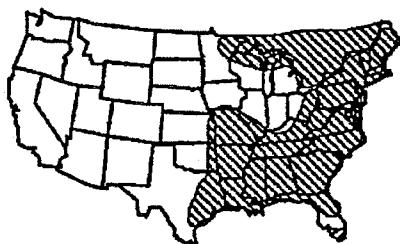
DESCRIPTION: The Northern Parula is one of the smallest and most distinctly marked of the North American wood warblers. They are 10.8-12 cm (4 1/4 - 4 3/4 in) in length with a wing spread of 17.8-19.7 cm (7-7 3/4 in). The males are bright blue-grey above; white below; an olive patch on the upper back; and two bold white wing bars. They have a white eye ring broken by a black eye line; and a bright yellow throat with a dusky, red-brown chest band. Females and juveniles are similar but paler, and have little or no throat band.



Robbins, Chandler S., Brunn, Bertel; and Zim,
Herbert S. *Birds of North America*. New York:
Golden Press, 1983.

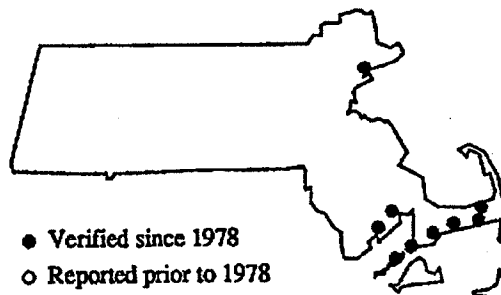
SIMILAR SPECIES IN MASSACHUSETTS: The Black-throated Blue Warbler (*Dendroica caerulescens*) has similar blue-grey upper parts, but lacks the double white wing bar, and has a black throat and face, instead of the yellow throat of *Parula americana*.

RANGE: The breeding range of the Northern Parula is from Nova Scotia to Manitoba, south to central Florida and Texas. It is generally associated in the north with the lichen Old-Man's Beard (*Usnea* spp.) and in the south with Spanish moss (*Tillandsia usneoides*). It winters primarily in Mexico, northern Central America and the West Indies.



Summer (breeding range)
Winter range

Breeding Range of the Northern Parula



Breeding Distribution in Massachusetts

HABITAT IN MASSACHUSETTS: *Parula americana* is characteristically found in wet woodlands, such as Red Maple (*Acer rubrum*) or Atlantic White-cedar (*Chamaecyparis thyoides*) swamps, river margins, pond shores, or even small depressions. It usually nests in association with the moss-like lichen, Old-Man's Beard (*Usnea* spp.).

LIFECYCLE/BEHAVIOR: In the northeast, the Parula begins nesting in late May or early June. The nest is generally in a hollowed out bunch of hanging *Usnea* lichen in either a deciduous or conifer tree. Though predominately made of *Usnea* spp., the nest may be sparsely lined with finely shredded moss, fine grasses, plant down, or a few hairs. Upon completion the nest resembles a hanging, grey pouch with an opening at or near the top. The nest may also be constructed of other material, such as burlap, leaf fragments, or grass, but this is exceptional. The height of the nest varies from 4 to 40 feet above ground with the average being 25 feet. The same nesting site is often occupied in successive seasons with eggs being laid in the same nest or in another nearby. *Parula americana* lays only one clutch of 4 to 5 eggs each year. The eggs are white to cream, speckled with brown, and are incubated for 12 to 14 days. The young fledge in another 11 to 12 days.

The male sings during the nesting season into late July, and frequently during spring migration. It has at least three main songs, with a great range of variations. The most common is a buzzy, ascending trill, ending with an abrupt explosive note: "swee swee swee swee swee-Zip!"

Like others in its family, the Parula feeds on a variety of small insects such as cankerworms, hairy tent caterpillars, gypsy moth caterpillars, beetles and spiders. When feeding, it hops from twig to twig, inspecting leaves, often hanging upside down, much like a chickadee, or it may creep along trunks or branches like a nuthatch.

This species migrates south in September and October with other warblers, particularly the Black-poll Warbler (*Dendroica striata*). *Parula americana* returns to Massachusetts in the beginning of May. It is more typically a migrant here than a summer resident.

POPULATION STATUS IN MASSACHUSETTS: Since the turn of the century, the breeding population of the Northern Parula in Massachusetts has experienced a slow but steady decline. Since 1978, nine breeding locations have been recorded in the state. By 1986, though still a common migrant, the Parula was known to breed in only four locations on Cape Cod and the Elizabeth Islands (Harwich, Mashpee, Osterville, Naushon Island), nesting primarily in or on the edges of Atlantic White Cedar (*Chamaecyparis thyoides*) swamps. Each site was estimated to have 2-5 pairs of birds with the total state population thought to number less than 15 pairs (Nikula, 1986). To date, it is believed that the number of breeding pairs has declined even more dramatically, with only one remaining known breeding location (Osterville), where as few as 5 breeding pair remain (Nikula, 1994). The species therefore appears to be in very serious danger of extirpation in Massachusetts and is presently listed as a state threatened species.

Reasons for the decline in Northern Parula populations in Massachusetts and elsewhere in the northeast remain unknown. The decline coincides with the decline of its favored nesting material, *Usnea*, which may be sensitive to air pollution and acid rain. It is not clear to what degree the Northern Parula decline is associated with their dependence on *Usnea*. Additionally, its wintering grounds have experienced considerable destruction through deforestation and development, which may be significant in the decline of this species.

MANAGEMENT RECOMMENDATIONS: Research on the nesting ecology, particularly with regard to the extent of the Parula's dependence upon *Usnea*, is needed to determine what role, if any, that relationship has impacted the species' decline. More information is needed on the Parula's wintering ecology and the effects of habitat alteration on the wintering grounds.

If the Northern Parula is being adversely affected by changes in its wintering grounds or by air pollution on the breeding areas, any attempt on the state level through habitat preservation and/or management are likely to be ineffective. Though the state must make every effort to insure the continued existence of suitable breeding habitat, ultimately, the future of the Northern Parula in Massachusetts may depend upon political decisions made at the national and international levels (Nikula, 1986).

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**PLANT INVENTORY &
WILDLIFE HABITAT
ASSESSMENT**

**BOSTON EDISON
NORTH PARCEL
VINE, LAGRANGE AND
BROOKLINE STREETS**

SEPTEMBER 22, 1997

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1.0 INTRODUCTION

Rimmer Environmental Consulting (*REC*) was contracted by the City of Newton on September 8, 1997 to conduct a Plant Inventory and Wildlife Habitat Assessment on a 33.47 acre parcel of land currently owned by Boston Edison. The property is bordered by LaGrange, Vine and Brookline Streets in the south-easternmost corner of Newton on the Brookline border (see Figure 1.0). The purpose of this investigation was to provide data and information needed by the City in order to evaluate the significance of the natural resources within the property.

The property is located within a densely developed residential area and is significant as it represents the only natural, wooded area of its size, with the exception of the contiguous land to the south of Vine Street, in such proximity to the inner city.

2.0 METHODS AND MATERIALS

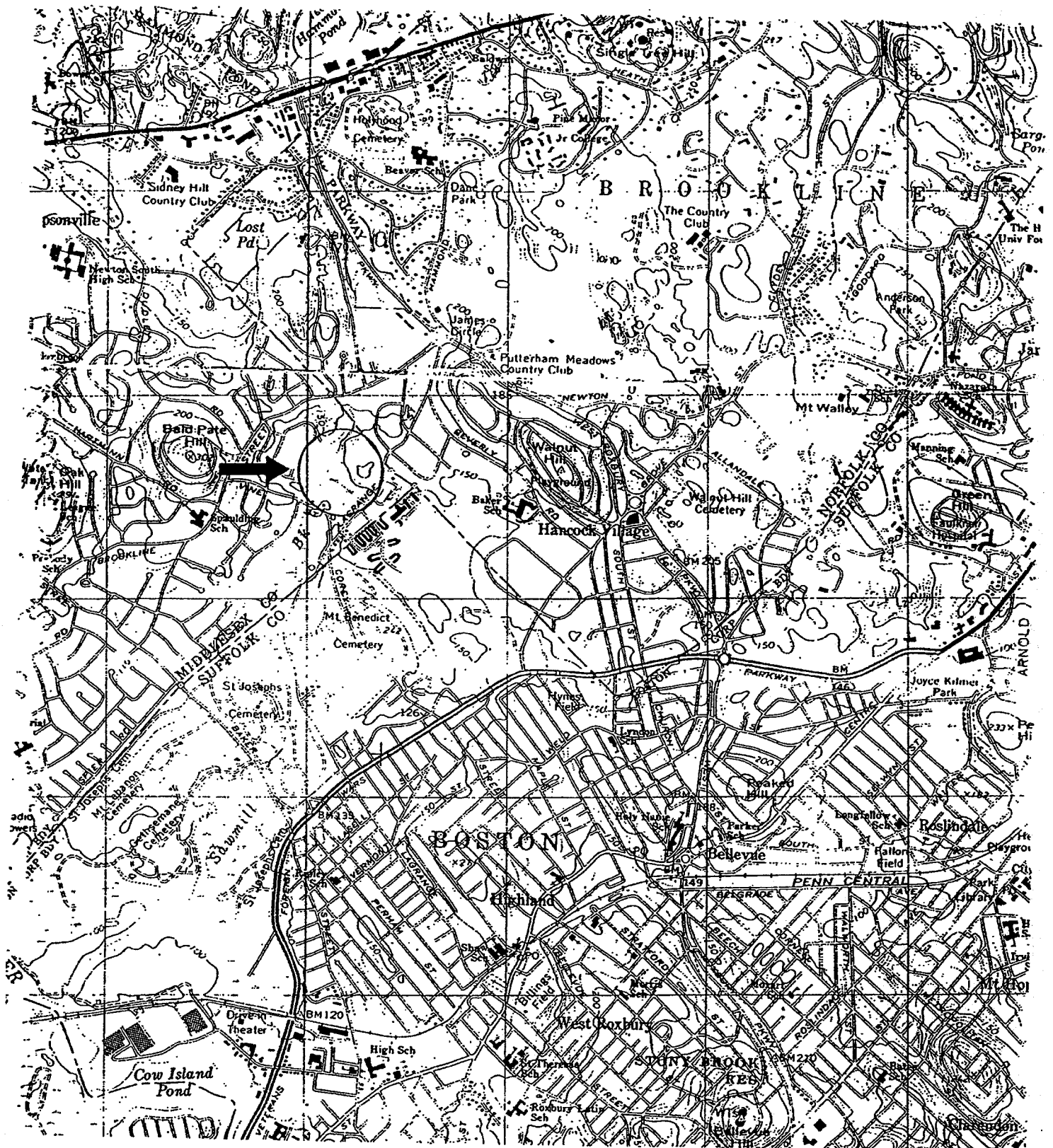
Existing maps and reports available from the City of Newton Planning Department were reviewed prior to field investigations. This data included wetlands and floodplain maps, topographic maps, aerial photography and a report prepared by John P. Richardson (1995) on the adjacent Sawmill Brook Conservation Area.

Field investigations were conducted on September 15, 1997 by Mary W. Rimmer and James S. MacDougall. The property was traversed on foot in order to closely observe the various plant communities present within the site. The property was divided into individual vegetative communities and plant species within each community were inventoried. Notes were taken on the approximate age of the plant community, its wildlife habitat value and any evidence of historic use. Special note was taken to record any rare or threatened species which might be present. Wildlife habitat was recorded both by direct observation and indirect evidence as scat, tracks, calls and cavity holes. Unique structural features such as bank undercuts, cavities and snags were also noted. Each vegetative community as well as any unique features were then photo-documented.

3.0 RESULTS

3.1 Topography and Drainage Patterns

The eastern portion of the property contains two large, conical knolls which are separated by Sawmill Brook which flows from north to south between them. The larger of the two, easily accessed off of LaGrange Street, contains sweeping views of the City. Much of the interior contains wetlands and floodplain communities associated with the major stream channels which cross the property.



BOSTON EDISON
NORTH PARCEL
NEWTON, MA

LOCUS MAP
USGS NEWTON QUADRANGLE
1970 SCALE:1:25,000

FIG. 1.0

RUMMER ENVIRONMENTAL CONSULTING

The parcel is located within the Charles River Basin and Coastal Drainage Area, approximately 1-1.5 miles from the Charles River. The intersection of Sawmill Brook and its South Branch occurs within the western portion of the property. Sawmill Brook, which originates at Hammond Pond, is culverted for much of its length but discharges into an open, natural channel within the north-eastern portion of the property, flows roughly north-south through the property and continues under Vine Street to City of Newton Conservation land. Sawmill Brook - South Branch flows roughly east to west through the site and under LaGrange Street. Both of these main stream channels were observed to be flowing, though at seasonally low rates, at the time of observation. Both streams were observed to contain strong septic odor which is affecting water clarity and quality.

Smaller tributaries to Sawmill Brook were also observed. One of these tributaries follows the northwestern property bound near Harwich Road and joins the South Branch and one flows along the northeastern border from Brookline Street and joins the main stem of Sawmill Brook. Both were found to be non-flowing or containing only pockets of standing water (Refer to Photo 15).

3.2 Vegetative Communities

The property was found to contain six distinct vegetative communities, including the following:

1. Scrub Oak-Pitch Pine Barren
2. Upland Oak-Hickory Forest
3. Upland Pine Forest
4. Red Maple Swamp
5. Scrub Shrub Swamp
6. Wet Meadow - Bramble Glade

These communities are arranged in order from the driest areas which occur at the higher elevations to the wettest communities occurring closest to the streams. The communities with higher species diversity generally were found to correspond with areas of higher soil moisture. The approximate location of these communities has been plotted on Figure 2. The above numbering system serves as a key to Figure 2.

3.2.1 *Scrub Oak-Pitch Pine Barren*

At the eastern side of the property, off of LaGrange Street, is a knoll (approximately 210 feet NGVD) formed of Roxbury Conglomerate, also known as "puddingstone." This geologic feature is formed by the melding of large, rounded boulders. The steep slopes and thin soils in this area provide little opportunity for most plant species to become established. However, pitch pine and scrub oak, which more typically thrive on the relatively sterile, sandy soils of southeastern Massachusetts can be found here (refer to

+



Photos 1 and 2). Also occurring are a few shrubs such as lowbush blueberry, and an occasional maleberry. Glossy buckthorn (also known as European Buckthorn), which is non-native and an aggressive invasive species was found to be creeping in on the few locations with deeper soil. The only herbs noted in this area were pink corydalis, which is often indicative of recent burns, and the sedge *Carex pennsylvanica*, which also favors drier soils. This site is significant as it represents a locally rare plant community.

3.2.2 Oak-Hickory Forest

The mid-slopes of the site along LaGrange, and also Vine Street and the far northern portions near Brookline Street are typical of much of southern New England upland forests. They consist primarily of a second-growth oak-hickory association, with a mixture of oaks of varying age dominating the plant community (refer to photos 3 and 4). These oak forests are often drier and contain a more open understory than similar forests to the north, largely due to the longer growing season and the lack of complete shading from the canopy. Another characteristic of southern New England forests is the relative youth of the trees due to the massive clearing which took place to support agriculture. It was estimated that this community is between 40 and 50 years old.

Red oak, white oak, and to a lesser extent, black oak dominate the canopy, with both shagbark and pignut hickory, white ash, black cherry, american beech and white pine also occurring. The understory is dominated by flowering dogwood, american chestnut, witch hazel, maple-leaf viburnum, lowbush blueberry and american hazelnut. Common herbs include sessile-leaved bellwort, false solomon's seal, lily-of-the-valley, bracken fern and tansy.

Three sub-communities were noted within this main vegetative community. The first occurs north of the intersection of Vine and LaGrange Street, where the tree size and evidence of gravel excavation indicate a slightly younger plant community, estimated at approximately 30 years old. This area contained similar species composition to the oak-hickory forest described above, but contained mostly pole-sized trees with more black cherry and a definite invasion of both glossy buckthorn and common buckthorn. Morrow's honeysuckle, norway maple, lily of the valley and pachysandra were also noted as either non-native or invasive species in this area. The slightly moister conditions, supported in part by road runoff, also provided habitat for a few northern arrow-wood and silky dogwood. Additional herbs included white wood aster, wild sarsaparilla, blue-stemmed goldenrod, poison ivy and virginia creeper. A few stressed and remnant red cedar along with a single apple provide evidence that suggests the site was historically in pasture or agricultural use.

The second sub-section community included a small area (approximately 1/2 acre) on the lower portions of the northern slope of the conglomerate knoll, along the north-eastern



PHOTO 1: SCRUB OAK-PITCH PINE FOREST ON CONGLOMERATE KNOLL



PHOTO 2: SCRUB OAK-PITCH PINE FOREST ON CONGLOMERATE KNOLL



PHOTO 3: OAK-HICKORY FOREST, VIEW WEST OFF LAGRANGE ST.

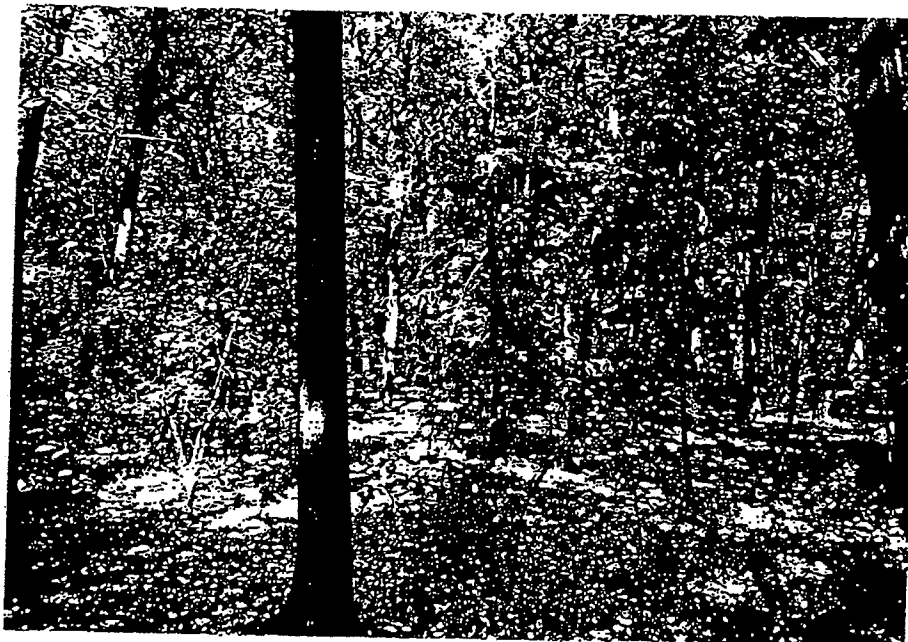


PHOTO 4: OAK-HICKORY FOREST, SMALL CHESTNUT IN MID FRAME

property line. This area contained a red maple canopy with an understory of witch hazel and ironwood (refer to Photo 5). This is the only location on the site where ironwood was observed. There was no herbaceous layer present.

The third sub-community included an approximately 500 square foot area of isolated wet meadow along LaGrange Street (refer to Photo 6) which consisted primarily of grasses and sedges including reed canary grass, arrow-leaved tearthumb, meadowsweet, spotted jewelweed, *Equisetum* sp., and sensitive fern. The invasive exotic herb, black swallowwort, was also found here. The one elderberry at this location was found to contain hollow branches which may have been created by the elderberry stem-borer beetle. This species is listed as a species of special concern by the Massachusetts Natural Heritage and Endangered Species Program. A small pile of camouflaged hunting clothes was also found in this area, indicating that the site is or has been used at some time for hunting.

3.2.3 Upland Pine Forest

The area between Brookline Street and Harwich Road in the northern corner of the property contains an upland pine forest, dominated by eastern white pine (see Photos 7 and 8). The numerous pits scattered throughout this area suggest the site was mined for gravel. Judging by the tree size, this likely occurred approximately 30-50 years ago. The pines have regenerated, along with a few scattered gray birch. Catbrier, black huckleberry and lowbush blueberry were also present. The side slopes and low spots contained some red and white oak as well as black cherry. The sparse herbaceous strata was represented by partridgeberry, wild sarsaparilla, poison ivy, hay scented fern and a few pink lady slipper.

3.2.4 Red Maple Swamp

All of the wetlands at the site are associated with the floodplain to Sawmill Brook and Sawmill Brook - South Branch. A typical New England red maple swamp community is present along the south side of Sawmill Brook - South Branch (refer to Photo 9). The very shallow-rooted trees and hummocks indicate frequent and prolonged seasonal inundation. This area contains a nearly complete canopy of large red maple, along with smaller american elm, red ash and a few trembling aspen, sycamore and cottonwood near the upland margins. The understory is dominated by northern arrow-wood, glossy buckthorn, silky dogwood and white ash. Herbs include sensitive fern, poison ivy, skunk cabbage and bittersweet nightshade. Along the stream banks, swamp white oak, spicebush, and the non-native garlic mustard are also common. This area is interspersed with the scrub-shrub community described below.



PHOTO 5: OAK-HICKORY FOREST SUB-COMMUNITY AT NORTHEAST PROPERTY LINE - RED MAPLE CANOPY WITH WITCH HAZEL AND IRONWOOD UNDERSTORY



PHOTO 6: OAK-HICKORY FOREST SUBCOMMUNITY, SMALL WET MEADOW OFF OF LAGRANGE STREET, SOUTH OF OF SAWMILL BROOK, SOUTH BRANCH



PHOTO 7: UPLAND WHITE PINE FOREST NORTHEAST OF HARWICH ROAD



PHOTO 8: UPLAND WHITE PINE FOREST OFF HARWICH ROAD SHOWING EVIDENCE OF RECENT EXCAVATION



**PHOTO 9: RED MAPLE SWAMP SOUTH EAST OF CONFLUENCE OF SAWMILL
BROOK AND SOUTH BRANCH SHOWING SHALLOW ROOTS**



PHOTO 10: DENSE SCRUB-SHRUB SWAMP IN FLOODPLAIN

3.2.5 *Scrub Shrub Swamp*

Much of the inner floodplain of Sawmill Brook contains a dense shrub swamp dominated by glossy buckthorn, silky dogwood and multiflora rose with an herbaceous strata consisting largely of poison ivy. The lack of trees, with the exception of a few trembling aspen, and the presence of invasive exotics such as buckthorn and multiflora rose suggest some type of recent soil disturbance, probably due to the construction of the sewer line through the property. Without further disturbance, it is expected this area will succeed into a red maple swamp similar in composition to the one described above.

3.2.6 *Wet Meadow - Bramble Glade*

Interspersed with the scrub shrub swamp within the inner floodplain, especially in the area of the confluence of the two main streams, are areas of dense meadows consisting of primarily red raspberry, spotted jewelweed and arrow-leaved tearthumb, with a few shrubs including silky dogwood, multiflora rose and staghorn sumac (refer to Photos 11 and 12). Surprisingly, there was no purple loosestrife (*Lythrum salicaria*) or common reed (*Phragmites australis*) observed within this area. These are typical and problematic invasive species that are presently inhabiting most wet meadows in southern New England. This community appears to also be the result of some recent land clearing. It is expected that multiflora rose will continue to advance in this area, especially on the margins.

3.3 *Mammals*

The property supports a variety of typical small mammals found in urban areas. Species directly observed include eastern chipmunk, gray squirrel and eastern cottontail. Raccoon scat was observed in numerous locations. Deer tracks were found in the red maple swamp. Short-tail shrew tunnels were observed beneath the leaf litter. Woodchuck dens were found in both the oak-hickory forest and the upland pine forest. In addition, the site likely supports striped skunk, white-footed mouse, star-nosed mole, southern flying squirrel, virginia opossum and red fox. According to Martha Horn, neighbors have reported coyote as well, although the site inspection did not reveal any specific evidence. There was also no indication of muskrat, mink or long-tailed weasel although the site may provide some of the habitat characteristics required (stream corridors and floodplain forests).

3.4 *Birds*

The time of year the site investigation was conducted greatly limits the evaluation of the avian use of the property, as breeding and nesting has long been completed and migration is well underway. The breeding use of the property is generally considered to be the most



**PHOTO 11: WET MEADOW-BRANCH GLADE ADJACENT TO SAWMILL BROOK -
VIEW NORTH**



**PHOTO 12: WET MEADOW-BRANCH GLADE ADJACENT TO SAWMILL BROOK
VIEW SOUTH**

significant in terms of bird habitat. A request has been placed on the internet Bird Chat Line to see if anyone has collected data during breeding season on this property. There has been no response as of the date of this report. However, Martha Horn will be apprised should this information become available.

The species list provided in Appendix II includes those species either seen, heard or observed through indirect evidence, including a red tailed hawk which was identified from a flight feather within the scrub-shrub swamp. According to Martha Horn, neighbors have reported a northern harrier on the property. Although it is possible a harrier might have been present, it is unlikely the site provides breeding habitat for this species, as they require more expansive meadows and marshlands than the site provides. Owls, including the great-horned owl and screech owl may also be present as they commonly inhabit urban woodlands. Martha Horn reports seeing a large, blocky bird on a snag off of Harwich Road which could have been a great-horned owl.

3.5 Reptiles and Amphibians

The only amphibian species directly observed were green frogs within and adjacent to Sawmill Brook. The poor water quality detracts significantly from the amphibian habitat value of the streams and wetlands on the property. Red-backed salamanders are likely in the upland areas, though the dry conditions this past summer have likely driven them deeper into the soil, making them harder to observe.

No reptile species were observed, however a number of snake species are likely to utilize the property as indicated in Appendix II. There have been reports of pygmy rattlesnake skins being found on the property. It is our opinion that the site does not provide native habitat for this species. It is possible that the animal was accidentally released, or it has been misidentified and is actually the eastern timber rattlesnake. The eastern timber rattlesnake (*Crotalus horridus*) is listed as an endangered species in Massachusetts. It has been reported in the Blue Hills in Milton. Further investigation should be conducted to confirm this siting.

No turtle species were observed, though the site might provide suitable habitat for painted turtles should water quality improve.

3.6 Invertebrates

Although an inventory of invertebrate species was not within scope of this report, several aquatic species, or lack thereof, are worth noting as they are indicators of water quality and therefore habitat value. Sawmill Brook was observed to contain some form of nematodes and isopods. Conspicuous by their absence were freshwater mussels, damselflies, and other aquatic insects and amphipods. Poor water quality due to sewage



**PHOTO 13: SAWMILL BROOK DISCHARGING ONTO PROPERTY
NOTE GRATE HAS BEEN DISLODGED**



**PHOTO 14: SAWMILL BROOK DOWNSTREAM OF CULVERT AND UNNAMED
INTERMITTENT CHANNEL ENTERING FROM BROOKLINE STREET. NOTE
GREYISH WATER COLOR**

effluent is likely to be an impediment to higher biologic diversity and a more complete aquatic community.

The presence of the elderberry stem borer beetle (*Desmocerus palliatus*) as discussed in section 3.2.2 above was confirmed by personal communication with Tim Simmons of the Mass. Natural Heritage and Endangered Species Program as likely to occur based upon the evidence observed. This is listed as a species of special concern in Massachusetts.

4.0 DISCUSSION AND CONCLUSION

The following comments are intended to assess and evaluate the observations and to make some general assumptions concerning the habitat provided by the parcel.

Habitat value can be measured in many ways. One simple method is to assess species diversity within the plant community, since a site with a high number of plant species has potential to support a greater array of animal species than sites dominated by one or two species. The number of distinct community types, or degree of vertical structure within each plant community can also be assessed. Habitat value is also evaluated by assessing the parcel's location within the landscape. A parcel which is isolated may contain only small or island populations of wildlife which may not be sustainable. A parcel which provides access to contiguous parcels may provide higher habitat value as it encourages the immigration/emigration of animal populations. Whether the parcel provides habitat which is locally limited is also an important consideration. If the project site is an upland oak-hickory forest within many hundreds of acres of oak-hickory forest, it might not be as significant as if it was the only parcel containing this community, therefore the only site providing this unique habitat within the vicinity.

The project site was found to contain a relatively high number vegetative communities for its size, largely due to the great variations in topography and the fluctuating water levels within the streams and adjacent wetlands. Each of these plant communities can support its own array of wildlife which utilize specific components of these communities for feeding, breeding, cover or simply migratory stopovers.

Within several of those communities were a high number of non-native and/or invasive plant species which tend to detract from the habitat value. Those species, noted in Appendix I, tend to grow aggressively and exclusively, reducing diversity. The scrub shrub wetland and the oak-hickory forest near the intersection of Vine and LaGrange have the highest number of non-native species and these are located, not by coincidence, in the areas of the site which were likely more recently disturbed. It is expected that both the common and the glossy buckthorn will continue to invade these sites. Asiatic bittersweet has pretty berries, but often chokes young trees and can grow into impenetrable thickets. This plant, present at only a few locations within the red maple swamp and shrub swamp

and is not currently representing a threat to species diversity but has potential to create problems. It is encouraging that neither purple loosestrife or common reed were found to be present.

Of more immediate concern to habitat value is the water quality of streams at the site. Both Sawmill Brook and its South Branch were observed to contain a strong sewage odor, possibly from broken or leaking sewer pipes in the area. The apparent lack of invertebrates in the waterways suggests that this effluent is adversely affecting the potential habitat for these pollutant sensitive species. A reduction in invertebrates at the lower end of the food chain has significant and cumulative impacts on species higher up the food chain. The effects are particularly severe during times of year when the stream contains lower flows, as the effluent has little opportunity to become diluted. Therefore, it appears the greatest threat to the habitat at present is water quality. Ironically, it is the streams and the wetlands and floodplains associated with them that typically provide the most important wildlife habitat. Any improvements in this area will likely be very significant to wildlife habitat. It is not known whether the streams on the site currently support fishery habitat. The poor water quality and low flow currently provide poor habitat for most warm-water and cold-water species.

The oak-hickory forest contains attractive and relatively undisturbed habitat, especially on the north and west slopes of the conglomerate knoll. This site contains the most mature habitat on the property. The portion closest to LaGrange Street contains several paths which appear to be used regularly by neighbors to walk their dogs.

The pitch pine/scrub oak barren appears to be the most unique and interesting community on the site, due to its interesting geology and the locally rare plant community.

The site inspection did not reveal evidence of any state or federally listed plant species or animals utilizing the site. Particular attention was given to attempting to locate populations cited in the report by John Richardson as being locally rare, including rattlesnake plantain, northern bunchberry and Indian cucumber root. However, none of these species were found at the site.

It should be noted that while no particularly rare species were located, this parcel can be considered to have significant habitat value simply because of its size, its proximity to contiguous natural land which offers a migratory corridor and most importantly, its relative rarity as part of an urban community. While some wildlife species which are tolerant to human activity will commonly inhabit backyards and small urban parks, many require more extensive and secluded tracks such as that provided by this site. Larger species such as Red-tailed hawk, red fox, white-tailed deer and red fox are unlikely to be found in these smaller, intensely used areas.

Finally, it is recognized that this inventory and habitat evaluation was limited by the time frame within which it was required to be completed. The observations made represent a snap shot of species present at the particular time of year and under particular environmental conditions (i.e., recent climatological and hydrological conditions, and recent human disturbances). More exhaustive site investigations conducted at different times of year would yield a slightly different inventory, especially as related to avian and amphibian habitat.



**PHOTO 15: MANMADE CHANNEL ENTERING SITE FROM BROOKLINE STREET,
TRIBUTARY TO SAWMILL BROOK**



**PHOTO 16: UNDERCUT BANKS ON SAWMILL BROOK COULD PROVIDE SHADE
AND COVER FOR FISH**

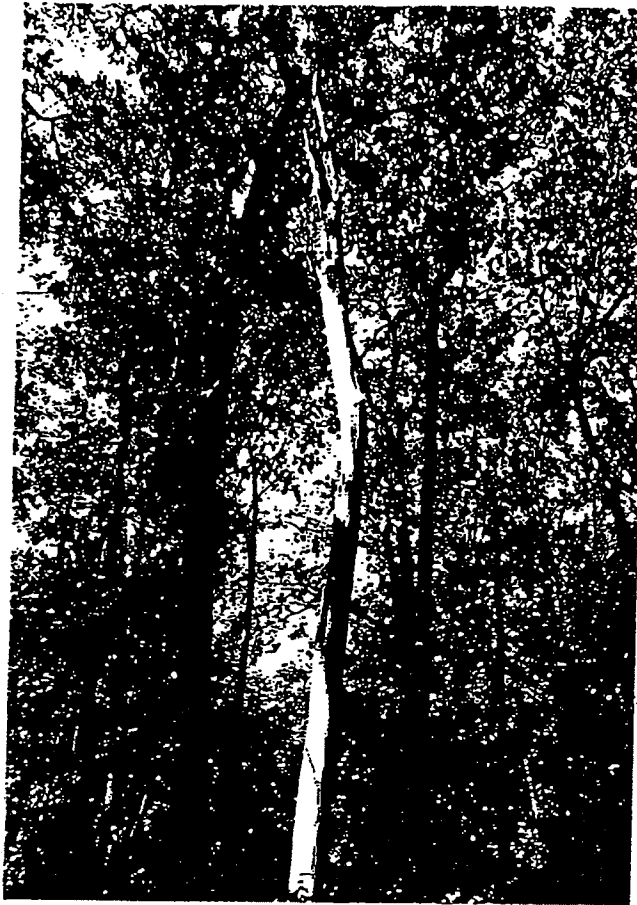


PHOTO 17: CAVITY TREE AT EDGE OF WOODED SWAMP

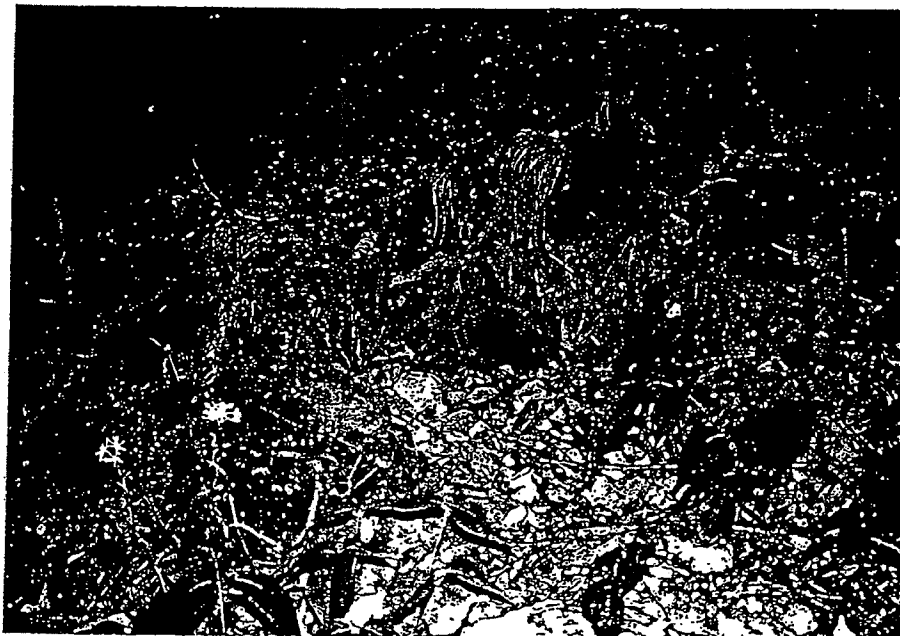


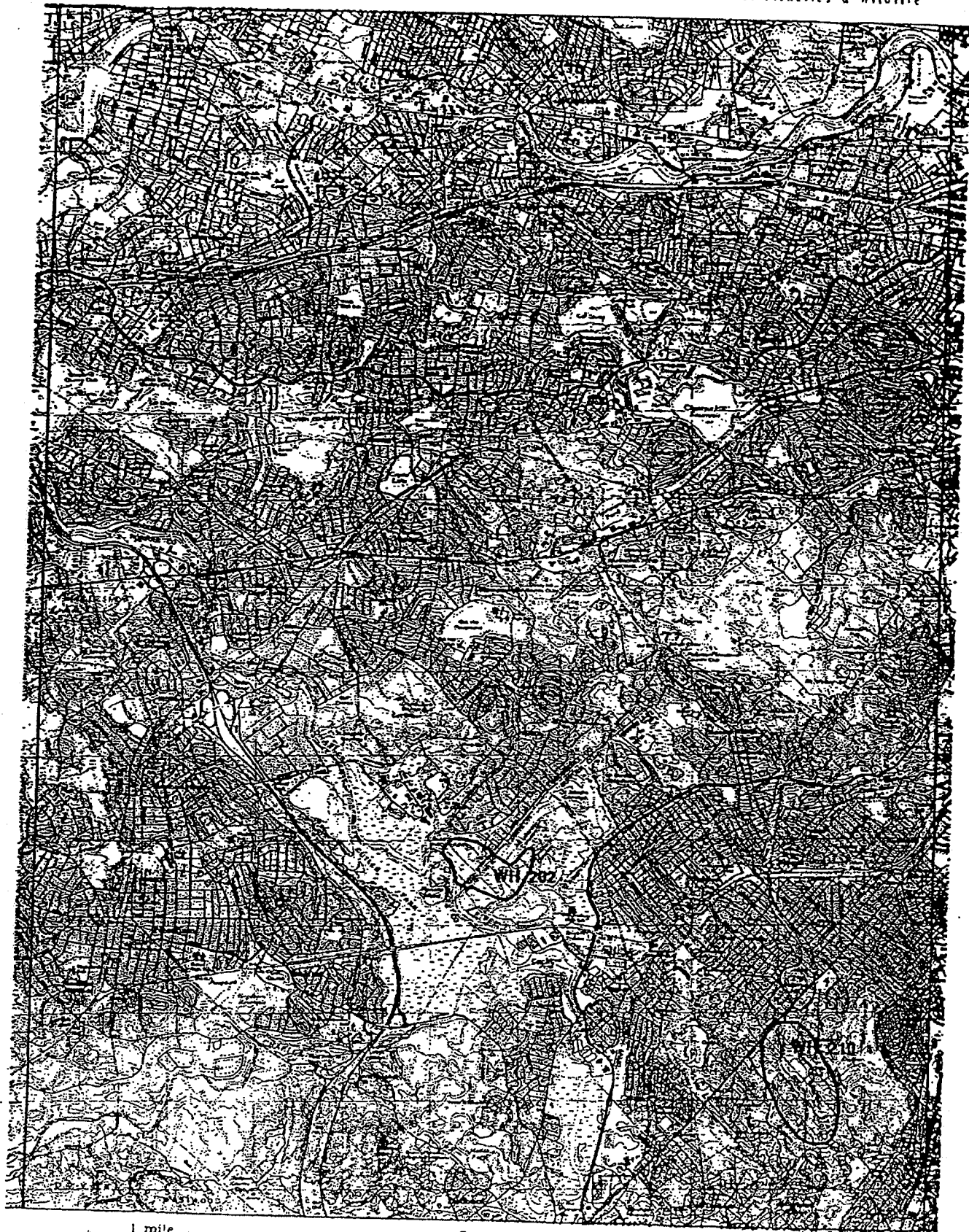
PHOTO 18: WOODCHUCK DEN IN PINE FOREST



ESTIMATED HABITATS OF RARE WILDLIFE AND CERTIFIED VERNAL POOLS

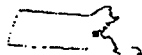
For use with the MA Wetlands Protection Act regulations (310 CMR 10).

Produced by Natural Heritage & Endangered Species Program, MA Division of Fisheries & Wildlife



0 1 mile
0 1 kilometer

See County Index Maps to
locate adjacent quadrangles



NEWTON, OHIO 1997

APPENDIX I
Plant Species Inventory

<u>Scientific Name</u>	<u>Common Name</u>	<u>Non-Native Species</u>
<i>Trees</i>		
Acer rubrum	red maple	
Acer platanoides	norway maple	X
Betula populifolia	gray birch	
Carya glabra	pignut hickory	
Carya ovata	shagbark hickory	
Castanea dentata	chestnut	
Fagus grandifolia	american beech	
Fraxinus americana	white ash	
Fraxinus pennsylvanica	red ash	
Juniperus virginiana	eastern red cedar	
Pinus rigida	pitch pine	
Pinus strobus	eastern white pine	
Platanus occidentalis	sycamore	
Populus deltoides	cottonwood	
Populus tremuloides	trembling aspen	
Prunus serotina	black cherry	
Pyrus malus	domestic apple	
Pyrus sp.	flowering crabapple	
Quercus alba	white oak	
Quercus bicolor	swamp white oak	
Quercus ilicifolia	scrub oak	
Quercus rubra	red oak	
Quercus velutina	black oak	
Tsuga canadensis	eastern hemlock	
Ulmus americana	american elm	
<i>Shrubs</i>		
Alnus serrulata	smooth alder	
Aronia arbutifolia	red chokeberry	
Carpinus caroliniana	ironwood	
Cornus amomum	silky dogwood	
Cornus florida	flowering dogwood	
Cornus racemosa	gray-stemmed dogwood	
Corylus americana	american hazelnut	
Gaylussacia frondosa	black huckleberry	
Hamamelis virginiana	witch hazel	

Plant Species Inventory

<u>Scientific Name</u>	<u>Common Name</u>	<u>Exotic Species</u>
<i>Ilex verticillata</i>	common winterberry	
<i>Lindera benzoin</i>	spicebush	
<i>Lonicera morrowii</i>	Morrow's honeysuckle	X
<i>Lyonia ligustrina</i>	maleberry	
<i>Rhamnus cathartica</i>	common buckthorn	X
<i>Rhamnus frangula</i>	glossy buckthorn	X
<i>Rhus typhina</i>	staghorn sumac	
<i>Rosa multiflora</i>	multiflora rose	X
<i>Rosa blanda</i>	smooth rose	
<i>Rubus allegheniensis</i>	blackberry	
<i>Rubus idaeus</i>	red raspberry	
<i>Salix alba</i>	white willow	
<i>Sambuca canadensis</i>	elderberry	
<i>Sassafras albidum</i>	sassafras	
<i>Spiraea latifolia</i>	meadowsweet	
<i>Vaccinium angustifolium</i>	late lowbush blueberry	
<i>Vaccinium corymbosum</i>	highbush blueberry	
<i>Viburnum acerifolium</i>	mapleleaf viburnum	
<i>Viburnum recognitum</i>	northern arrow-wood	
<i>Viburnum cassinoides</i>	northern wild raisin	
<i>Vines</i>		
<i>Celastrus orbiculatus</i>	asiatic bittersweet	X
<i>Parthenocissus quinquefolia</i>	virginia creeper	
<i>Smilax rotundifolia</i>	catbriar	
<i>Vitis labrusca</i>	foxgrape	
<i>Herbs</i>		
<i>Alliaria officinalis</i>	garlic mustard	X
<i>Aster divaricatus</i>	white wood aster	
<i>Aralia nudicaulis</i>	wild sarsaparilla	
<i>Arisaema atrorubens</i>	jack-in-the-pulpit	
<i>Asclepias syriaca</i>	common milkweed	
<i>Carex pennsylvanica</i>	sedge	

Appendix I
page three

Plant Species Inventory

<u>Scientific Name</u>	<u>Common Name</u>	<u>Exotic Species</u>
Cirsium sp.	thistle	
Convallaria majalis	lily-of-the-valley	X
Corydalis sempervirens	pink corydalis	
Cynanchum nigrum	black swallowwort	X
Cypripedium acule	pink lady slipper	
Dennstaedtia punctilobula	hayscented fern	
Equisetum sp.	horsetail	
Impatiens capensis	spotted jewelweed	
Lycopodium obscurum	tree clubmoss	
Maianthemum canadense	canada mayflower	
Mitchella repens	partridgeberry	
Onoclea sensibilis	sensitive fern	
Osmunda cinnamomea	cinnamon fern	
Osmunda claytoniana	interrupted fern	
Oxalis europea	wood sorrel	
Pachysandra procumbens	pachysandra	X
Phalaris arundinacea	reed canary grass	X
Polygonum sagittatum	arrow-leaved tearthumb	
Pteridium aquilinum	bracken fern	
Rhus toxicodendron	poison ivy	
Solanum dulcamara	bittersweet nightshade	
Solidago caesia	blue-stemmed goldenrod	
Solidago rugosa	rough-stemmed goldenrod	
Smilacina racemosa	false solomon's seal	
Symplocarpus foetidus	skunk cabbage	
Tanacetum vulgare	tansy	
Uvularia sessifolia	sessile-leaved bellwort	

APPENDIX II

Mammals

The following species were found to be present on the site, either by direct observation or observation of sign:

<u>Scientific Name</u>	<u>Common Name</u>	<u>Observation by:</u>
Blarina brevicauda	short-tailed shrew	tunnels
Marmota monax	woodchuck	dens
Odocoileus virginianus	white-tailed deer	tracks
Procyon lotor	raccoon	scat, tracks
Sciurus carolinensis	eastern gray squirrel	direct
Sylvilagus floridanus	eastern cottontail	direct
Tamias striatus	eastern chipmunk	direct

The following species were not observed, but are presumed likely to be present:

Condylura cristata	star-nosed mole
Didelphis virginianus	virginia opossum
Mephitis mephitis	striped skunk
Microtus pennsylvanicus	meadow vole
Glaucomys volans	southern flying squirrel
Peromyscus leucopus	white-footed mouse
Vulpes vulpes	red fox

The following species were not observed, but were reported to be present by a neighbor

Canis latrans	coyote
---------------	--------

Reptiles and Amphibians

The following species were observed:

<u>Scientific Name</u>	<u>Common Name</u>	<u>Observation by:</u>
Rana clamitans melanota	green frog	direct

The following species are presumed likely to be present:

Lampropeltis triangulum	eastern milk snake
Plethodon cinereus cinereus	red-backed salamander
Storeria dekayi	northern brown snake
Thamnophis sirtalis	eastern garter snake

APPENDIX II

Page two

Birds

The following species were found to be present on the site, either by direct observation or observation of sign:

<u>Scientific Name</u>	<u>Common Name</u>	<u>Observation by:</u>
Buteo jamaicensis	red-tailed hawk	feather
Cardinalis cardinalis	northern cardinal	call
Colaptes auratus	yellow-shafted flicker	call
Cyanocitta cristata	blue-jay	direct
Dumetella carolinensis	gray catbird	call
Parus atricapillus	black-capped chickadee	direct
Picoides pubescens	downy woodpecker	direct
Sitta carolinensis	white-breasted nuthatch	direct
Vireo olivaceus	red-eyed vireo	direct

The following is a partial list of species which were not observed but are presumed to be present:

Agelaius phoeniceus	red-winged blackbird
Bubo virginianus	great-horned owl
Corvus brachyrhynchos	american crow
Dendroica petechia	yellow warbler
Geothlypis trichas	common yellowthroat
Melospiza melodia	song sparrow
Mimus polyglottos	northern mockingbird
Otus asio	screech owl
Parus bicolor	tufted titmouse
Quiscalus quiscula	common grackle
Sturnus vulgaris	european starling
Turdus migratorius	american robin
Zenaidura macroura	mourning dove

The following species was reported by a neighbor as being sited at the property:

Circus cyaneus	northern harrier
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SAW MILL BROOK CONSERVATION AREA



Locally rare Bunchberry (*Cornus canadensis*)

SAW MILL BROOK CONSERVATION AREA

John P. Richardson Report - 1995

CONTENTS

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Statement of Significance	1
Map showing areas covered By John P. Richardson	2
Observations - Wildlife & uncommon plants	7,8
Postagricultural Succession	12,14
Existing & Proposed trails	4,5
Possible historical site	19
<u>Scarce local plants</u>	

Bunchberry	Cover
Rattlesnake Plantain	7,8
Poison Sumac	7,8
Indian Cucumber Root	7,8,20
Highbush Cranberry	18
Balsm Fir	15

SAW MILL BROOK CONSERVATION AREA

STATEMENT OF SIGNIFICANCE

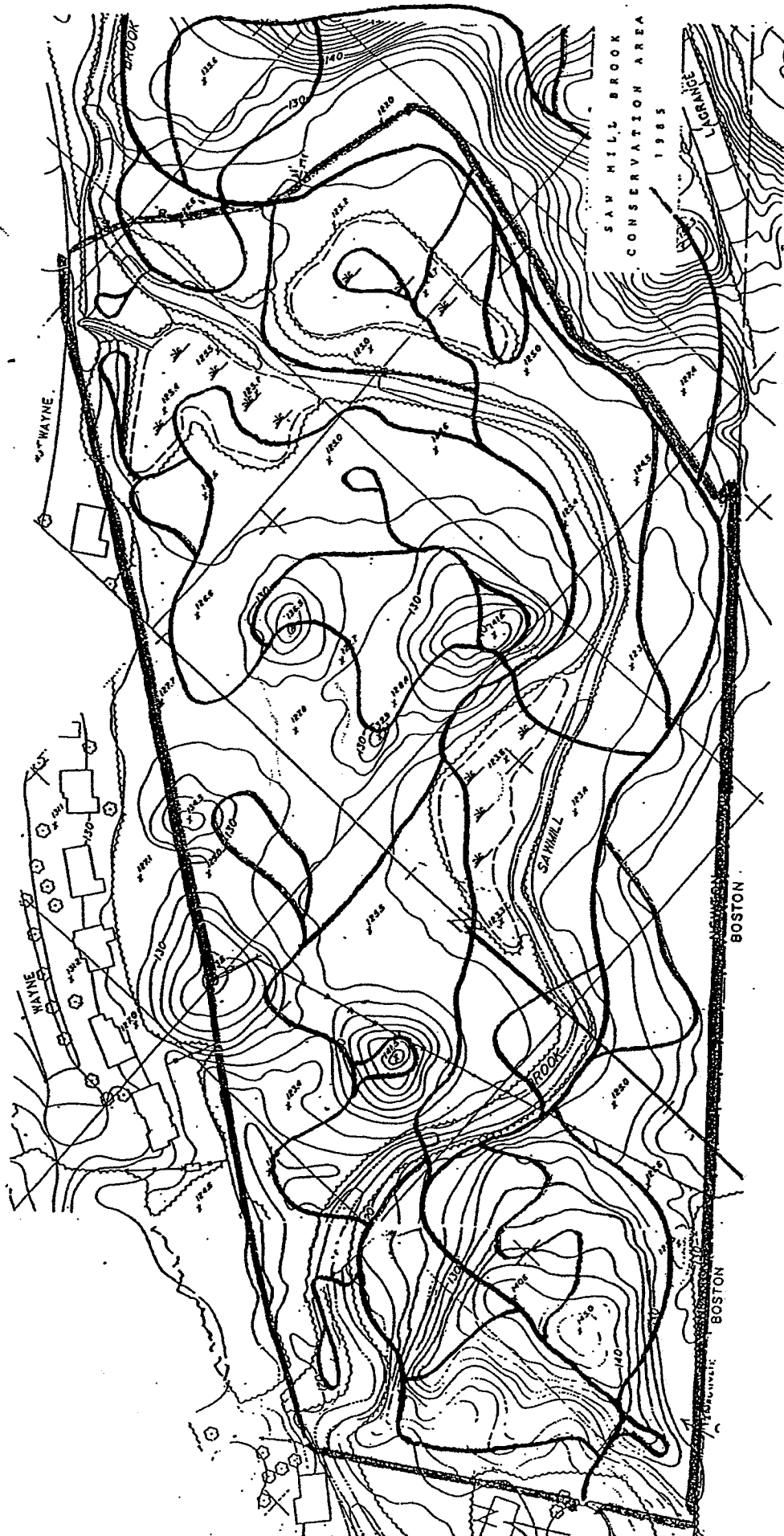
The Saw Mill Brook Conservation Area is an exquisite urban-centered mill stream woods. It is a natural woodland and wetland complex to be used only for relaxation, wildlife observaton, geological study and for educational purposes.

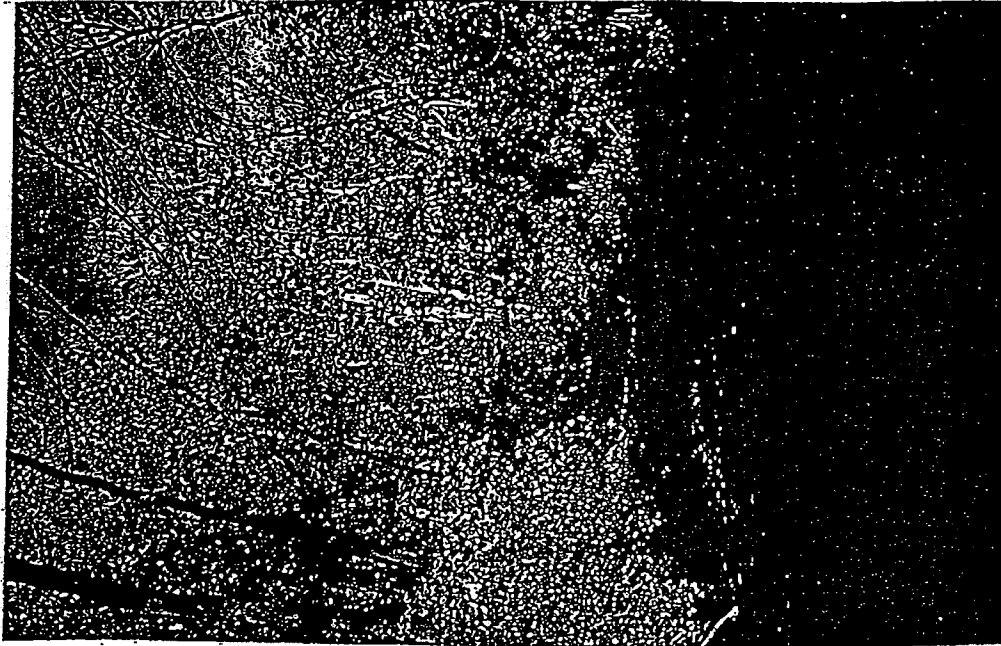
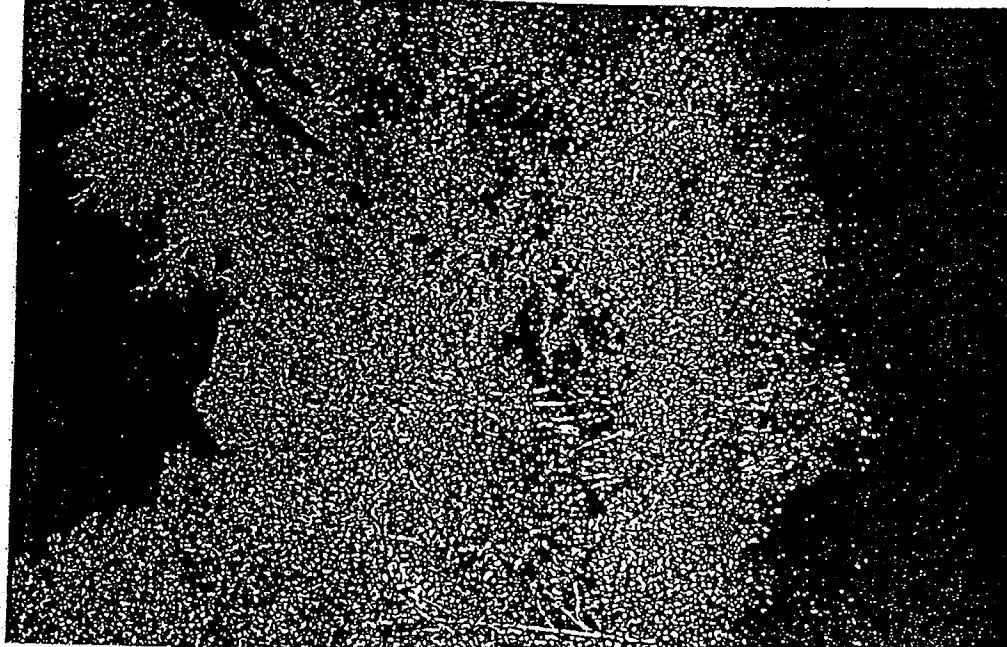
The Saw Mill Brook Preserve is the sort of natural area where the visitor comes and goes leaving only footprints on the trails.

The folloing attributes interact to establish a strong Saw Mill Brook Preserve statement:

1. The hillsides and the conical knolls
2. The outstanding conglomerate ledges and glacial erratic boulders
3. Saw Mill Brook
4. The marsh wildlife habitats
5. Mixed Postagricultural forest
6. Historic conglomerate stone fences

RED LINES APPROXIMATE ROUTES TRAVELED BY JOHN P. RICHARDSON
DURING HIS STUDY OF THE SAW MILL BROOK CONSERVATION AREA
FROM AUGUST 27, 1995 to November 28, 1995





Above are three photographs of a panoramic Saw Mill Brook scene. The photographs do not match together exactly because of the shrub thickets and trees that blocked my line of vision. They do convey a statement relative to the preserves natural integrity which is that this conservation area is a beautiful mill stream woods and wildlife habitat where human kind should visit, observe and depart leaving only footprints.

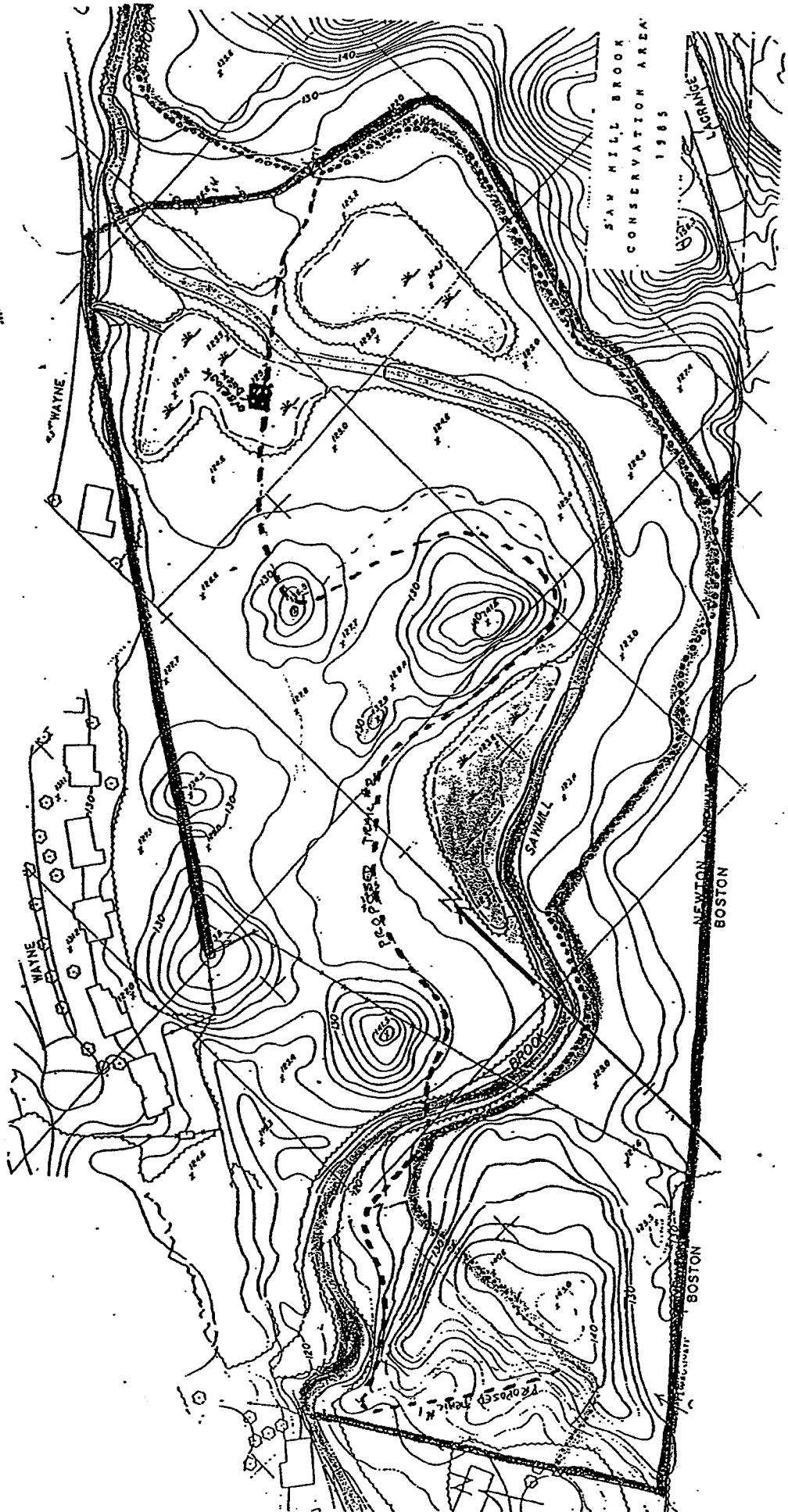
EXISTING AND PROPOSED TRAILS AT THE SAWMILL BROOK CONSERVATION AREA

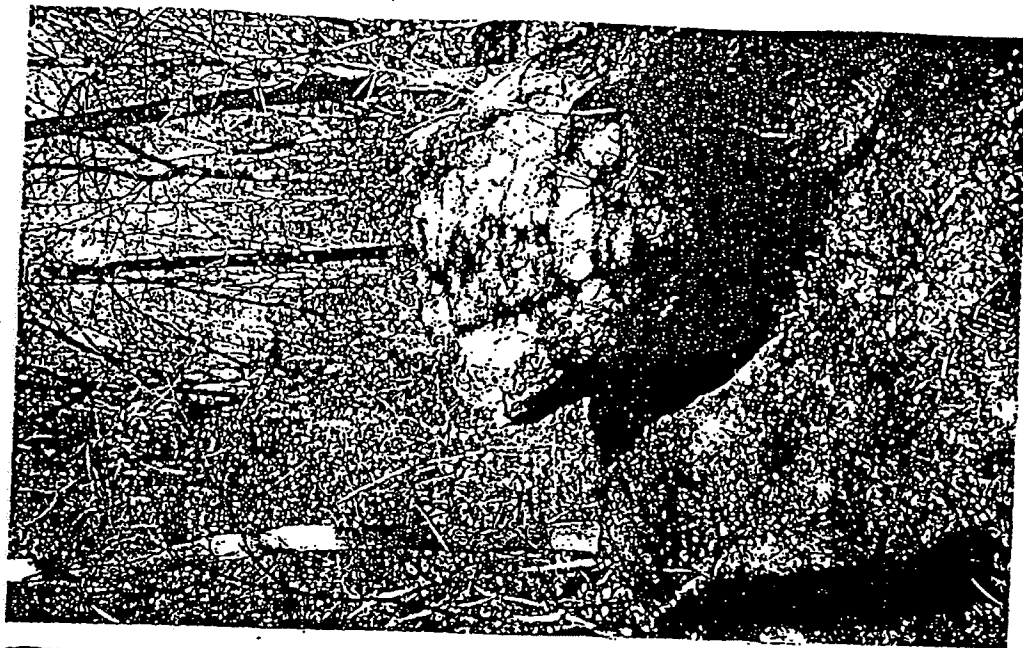
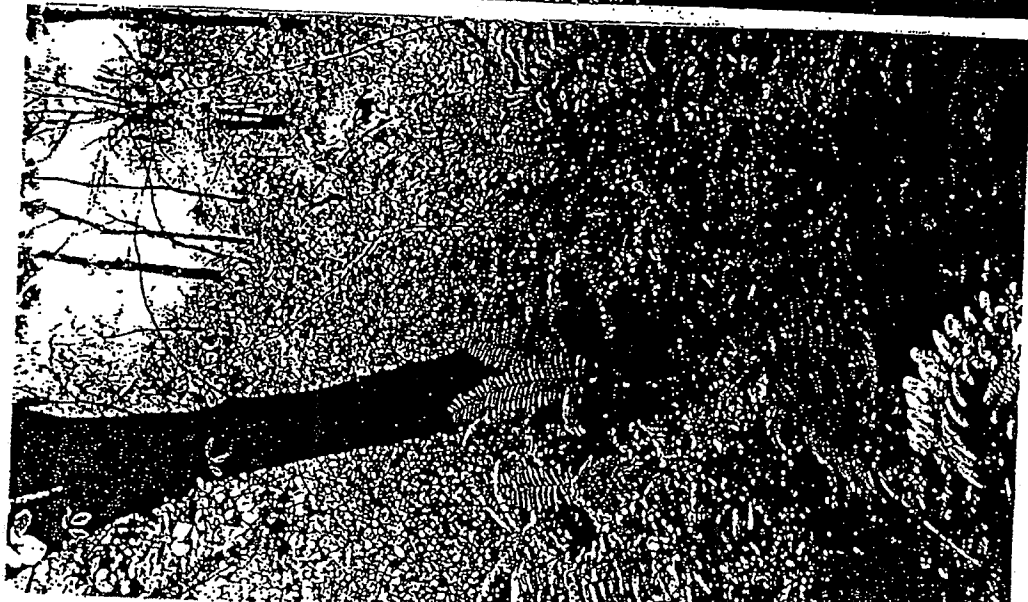
The existing trail runs from Marla Circle to Vine Street but requires the visitor to back track on the same trail. (the existing trail is in good repair and was thoughtfully laid out). I propose adding two new loop trails (See illustration, page 5). Proposed trail #1 is a short trail but leads the visitor to the top of a bluff from which there is a panoramic view upstream along Saw Mill Brook. The view is illustrated in the photographs on page 3 . This elevated view along the brook is somewhat dramatic when the brook is rushing along or when there is fall color. An unusual wild view in Newton. This trail would then descend the steep slope to the brook floodplain and rejoin the main trail.

Proposed trail #2 crosses Saw Mill Brook leading the visitor along the sides of conical knolls, by marsh habitats, through mixed woods to the summit of a conical hill then across a beautiful marsh by an ascending boardwalk to a marsh overlook observation deck, then the boardwalk descends, crosses the brook and rejoins the main trail. This could be a somewhat dramatic and beautiful trail which would culminate in the more or less, unconventional marsh overlook. This railed deck would be on legs perhaps five or six feet to get it up over the dense swamp rose, shrub and wildflower thicket. I have observed similar raised marsh overlooks in Florida's Great Cypress Swamp, the Everglades and in Georgia's Okefenokee Swamp. It gets the visitor up over the marsh so that they look down on the plants and abundant wildlife. I have observed many birds here as well as an extraordinary number of Swallowtail Butterflies.

MAP ILLUSTRATING EXISTING TRAIL, PROPOSED TRAILS, ELEVATED
MARSH OVERLOOK, AND SENSITIVE MARSH AREAS

PARK BOUNDARY
SAW MILL BROOK
SENSITIVE MARSHES
EXISTING TRAIL
PROPOSED TRAILS





Above are three unmatched photographs which illustrate the quiet, peaceful beauty of the Saw Mill Brook Conservation Preserve. Scenes as these - ferns, flowing brook and wonderful conglomerate stone formations are common place at Saw Mill Brook. As a visitor walks from the densely populated city into the Saw Mill Brook Preserve tensions can drop away. A visitor can relax and enjoy a kinship of renewal with Nature in this relatively unspoiled inner-city Shang-gri-la.

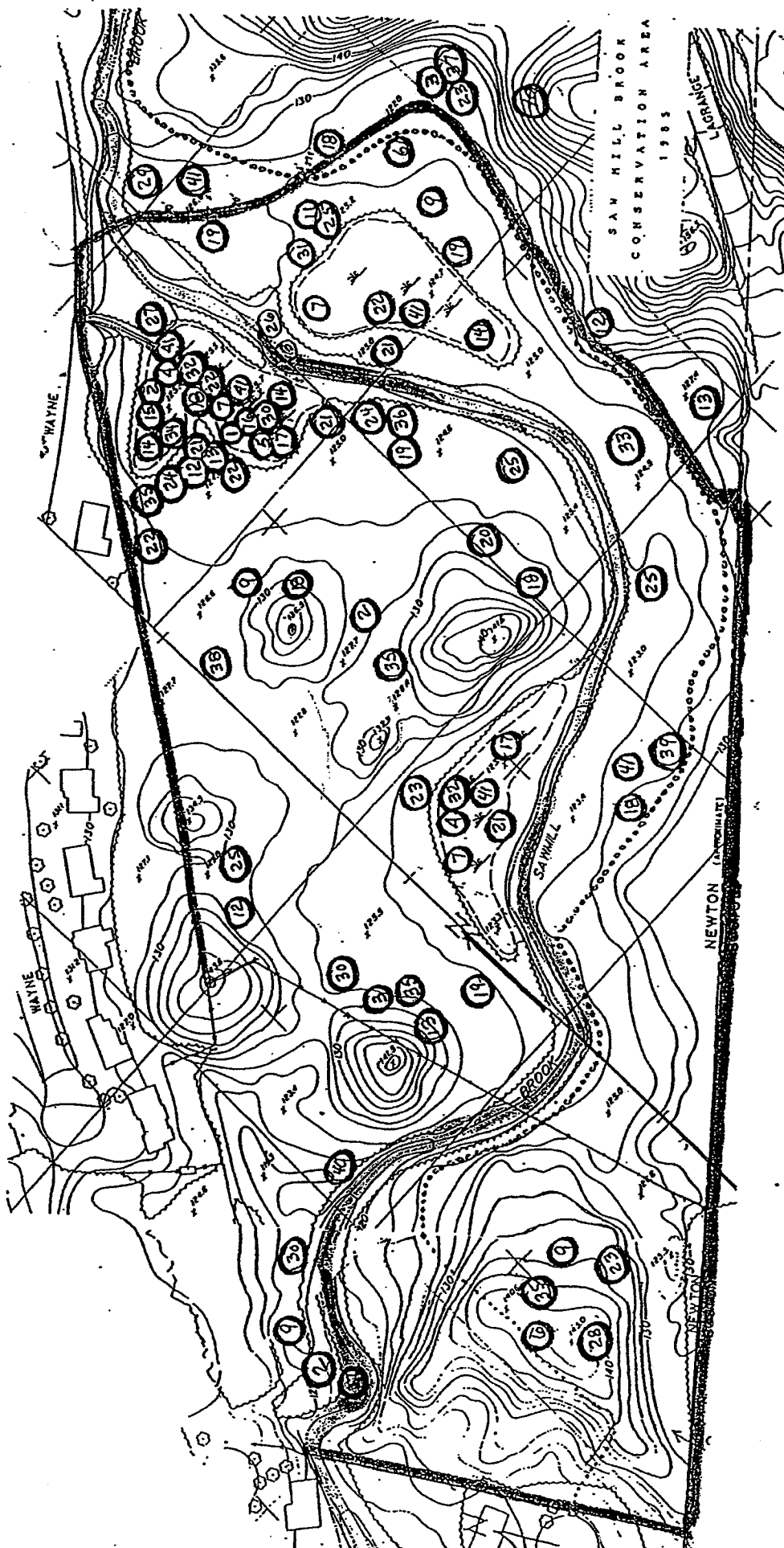
A LIST OF WILDLIFE AND SCARCE PLANT SPECIES OBSERVED AT THE SAW
MILL BROOK CONSERVATION AREA FROM AUG. 28 TO NOV. 28, 1995

OBSERVER: JOHN P. RICHARDSON (See page 8)

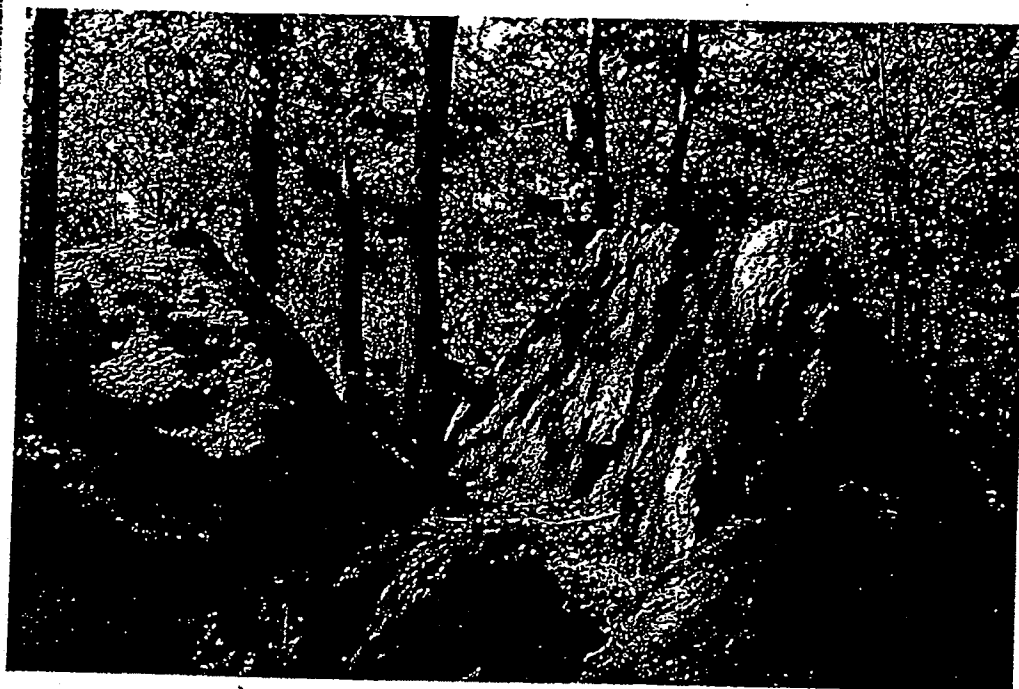
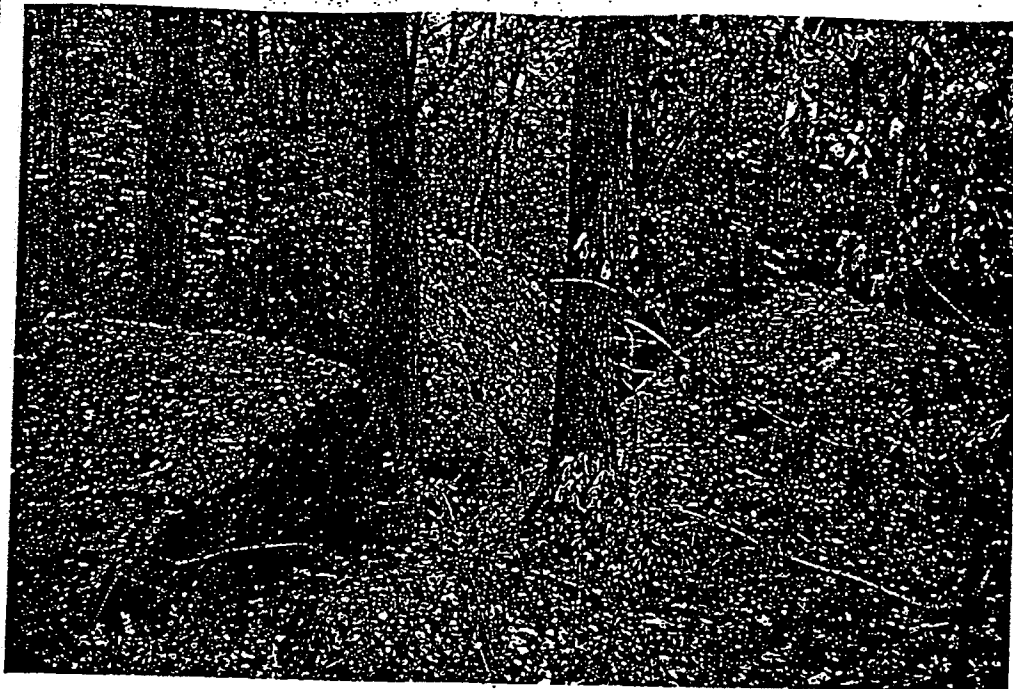
- | | |
|---|--|
| 1. American Kestrel | 24. Song Sparrow |
| 2. Red-tailed Hawk | 25. White-throated Sparrow |
| 3. Downy Woodpecker | 26. Chipping Sparrow |
| 4. Eastern Phoebe | 27. Swamp Sparrow 8-30-95 |
| 5. Eastern Screech Owl
(Evening 8-29-95) | 28. Brown-headed Cowbird
(Small flock, 9-15-95) |
| 6. Mourning Dove | 29. Common Grackle
(Flock of ab.50 9-26-95) |
| 7. Eastern Wood-Pewee | 30. Northern Oriole 8-30-95 |
| 8. Parakeet (?) A shock to
me. Greenish color.
Blue on wings when it flew | 31. American Goldfinch |
| 9. Northern Flicker | 32. Indigo Bunting 8-30-95 |
| 10. Hairy Woodpecker | 33. Dark-eyed Junco
(Flock 11-27-95) |
| 11. Cedar Waxwing
Flock of 8 or 10 on
Red Cedars. 9-23-95 | 34. Bearded Hornet Nest |
| 12. Blue Jay (Common on site) | 35. Chipmunk |
| 13. Tufted Titmouse | 36. Garter Snake |
| 14. Black & White Warbler | 37. Rattlesnake Plantain
(Epipacti pubescens)
6 plants only |
| 15. Robin (nesting) 8-28-95
Otherwise common on site | 38. Indian Cucumber Root
(Medeola virginiana)
3 plants only |
| 16. Northern Parula | 39. Bunchberry
(Cornus canadensis)
About 56 plants |
| 17. Yellow-throated Vireo
9-15-95 | 40. Carolina Rhododendron
(R. carolina)
One shrub only - escape ? |
| 18. Black-capped Chickadee | 41. Poison Sumac
(Rhus vernix) One plant |
| 19. Yellow Warbler | 42. Catbird |
| 20. Red-breasted Nuthatch | |
| 21. Common Yellow Throat | |
| 22. Northern Cardinal | |
| 23. Rufous-sided Towhee | |

LOCATIONS WHERE WILDLIFE AND SCARCE PLANT SPECIES WERE OBSERVED
AT THE SAW MILL BROOK CONSERVATION AREA FROM AUGUST 28 TO NOVEM-
BER 27, 1995. OBSERVER: JOHN P. RICHARDSON

(Numbers are keyed to list on page 7.)



A significant feature establishing the natural integrity at Saw Mill Brook are the stunning Roxbury Conglomerate ledges and the glacial errati boulders.

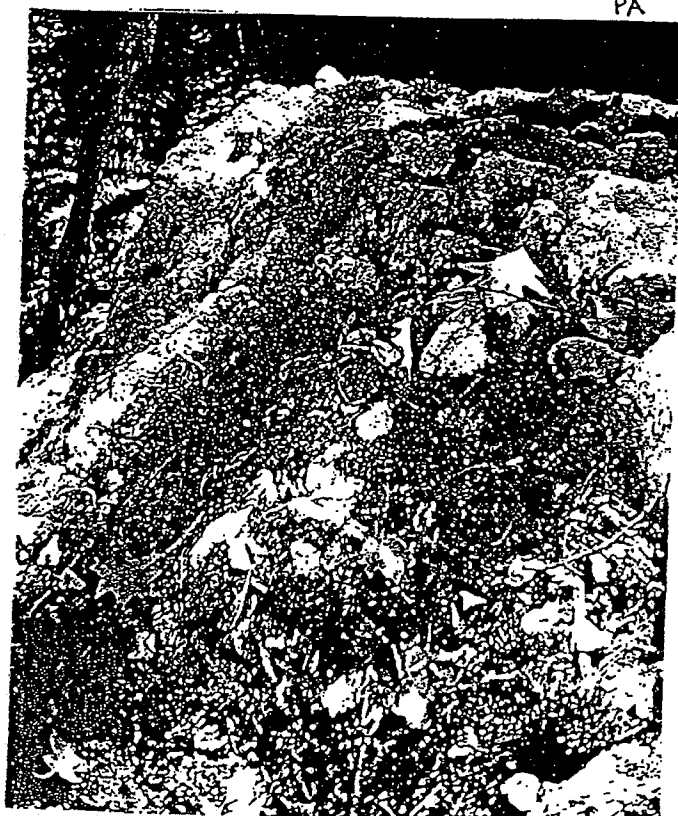




PA



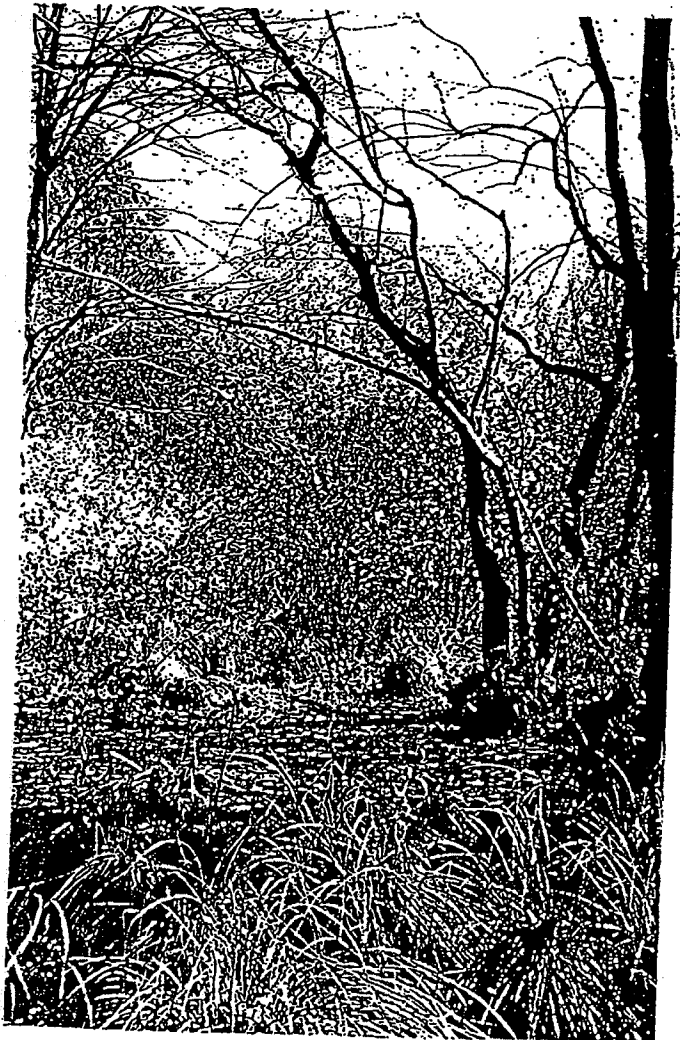
PB



PA - A Roxbury Conglomerate Stone fence attests to back-breaking labor by Newton's colonial settlers. Walls like this often divided grazing lots from planting lots. Split rail fencing were used to heighten the fence.

PB - Callous growth from an oak tree is reaching out in an attempt to devour the ledge

PC - One of the high points at Saw Mill Brook are the beautiful conglomerate ledges and boulders. Some are covered with mosses and lichens.



Inside the marsh community habitat
somewhere along the banks of Saw
Mill Brook

VEGETATIVE SUCCESSION AT THE SAW MILL BROOK CONSERVATION AREA

Walking along the Saw Mill Brook trail it is difficult to picture the landscape as anything but forested. However within the scope of the lives of people still living the Saw Mill Brook Preserve was pasture or crop land. Now we call it Postagricultural land. Stone walls are always a sign that the land was once cleared, and there are several stone walls within the Saw Mill Brook Preserve. Stone walls were boundaries between pasture and crop land. Sometimes the forest growth is dramatically different on one side of a wall from that on the other side of the wall. This is true at Saw Mill Brook. The Edison property on one side of the stone wall by the trail is vegetated with an older oak forest while the vegetation on the Saw Mill Brook side of the wall tends to be much less advanced. Some of the forest on the Edison tract is sixty to seventy five years old or older while that on the Saw Mill Brook side of the wall is less than fifty years old. Along the brook itself the vegetation is only thirty to forty years old at the most.

There are some living Red cedars (*Juniperous virginiana*) near Saw Mill Brook along the existing park trail. One of these cedars contains approximately 67 annual growth rings. Another about 58 annual rings. Red cedars grow in open sun-flooded conditions and germinate best in thick pasture turf. This indicates that the oldest cedar germinated in a pasture environment about 1928. The other cedar germinated about 1937. This is significant evidence suggesting that prior to 1940 a portion of the Saw Mill Brook Preserve was pasture.

Where does the succession process go from here? No one can really tell. Now that this land is protected from human interference the

PA

Once Saw Mill Brook was cleared agricultural land. Natural succession is now returning it to woodland. Birds and wind deposit seeds. Here a small clump of the evergreen Tree Clubmoss (*Lycopodium obscurum*) is gaining a foothold. Likes damp open woods. Can be made extinct in local areas by persons seeking Christmas greens.



PA

PB

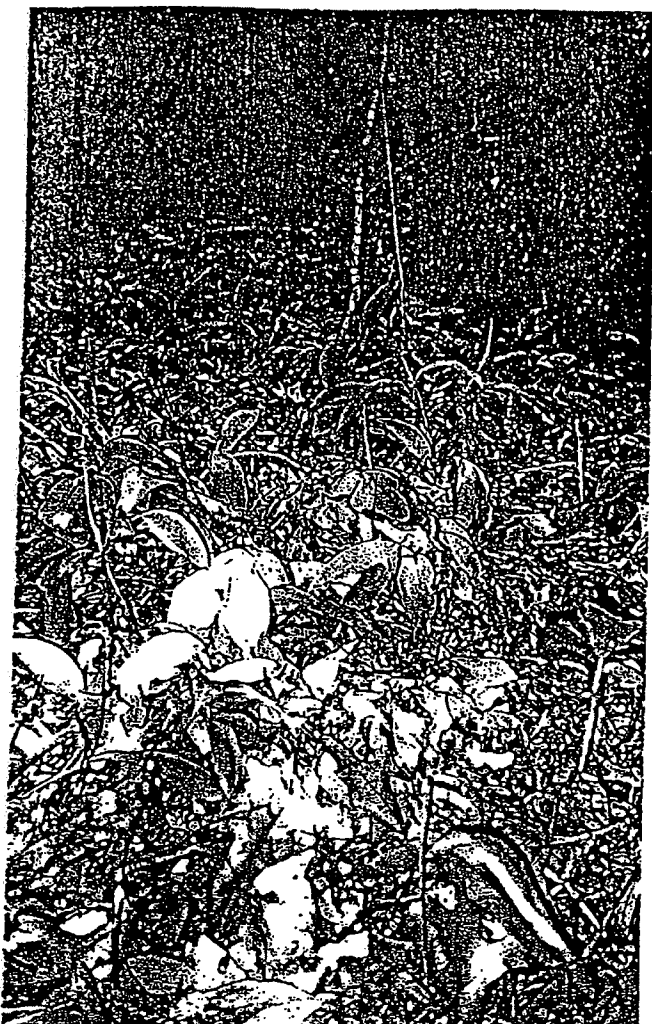
Climbing Bittersweet
(*Celastrus scandens*)

Berries are used for decoration as well as being a wildlife food. A Mockingbird was eating berries from this vine as I approached it

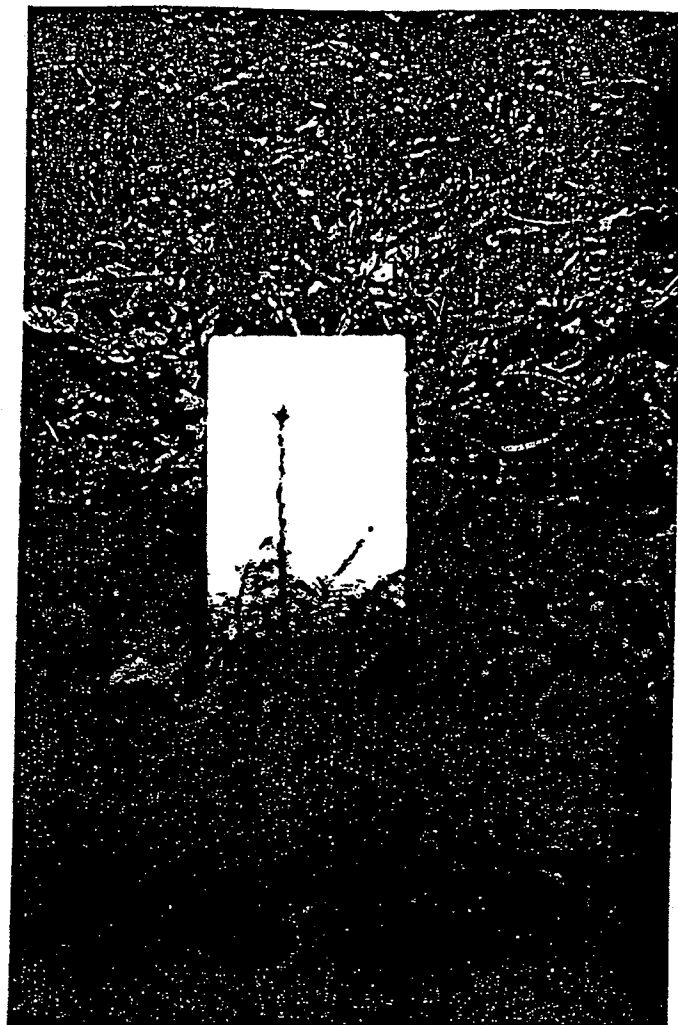


PB

Where does the succession process go from here ? Noone can really tell. Now that this land is a protected park the forest will continue to mature and change internally. It will take another one hundred years or perhaps two hundred years before the humus builds up enough to approximate the pre-settlement virgin forest condition. Birds and wind will deposit seeds from southern and northern species. Already new species are pioneering. I noticed two, two or three year old Balsm Fir (*Abies balsamea*) seedlings (See illustration, page page 15) on the north side of Saw Mill Brook. Both have sprouted beneath pines where birds might have dropped seeds. There is at least one colony of the northern Bunchberry (*Cornus canadensis*), a tiny colony of three Indian Cucumber Root (*Medeola virginiana*) and a small patch of the beautiful evergreen Rattlesnake Plantain (*Epipacti pubescens*). This is all indicative of changes to come. As the forest matures some of the trees may attain awesome height and girths. Others will be overtopped and will die. It will be at least another century (if humankind leaves the park alone) before the virgin forest condition BEGINS to return. Natural calamities are unpredictable. A tropical hurricane or insect infestation could change the character of a portion or even all of the preserve.



PA



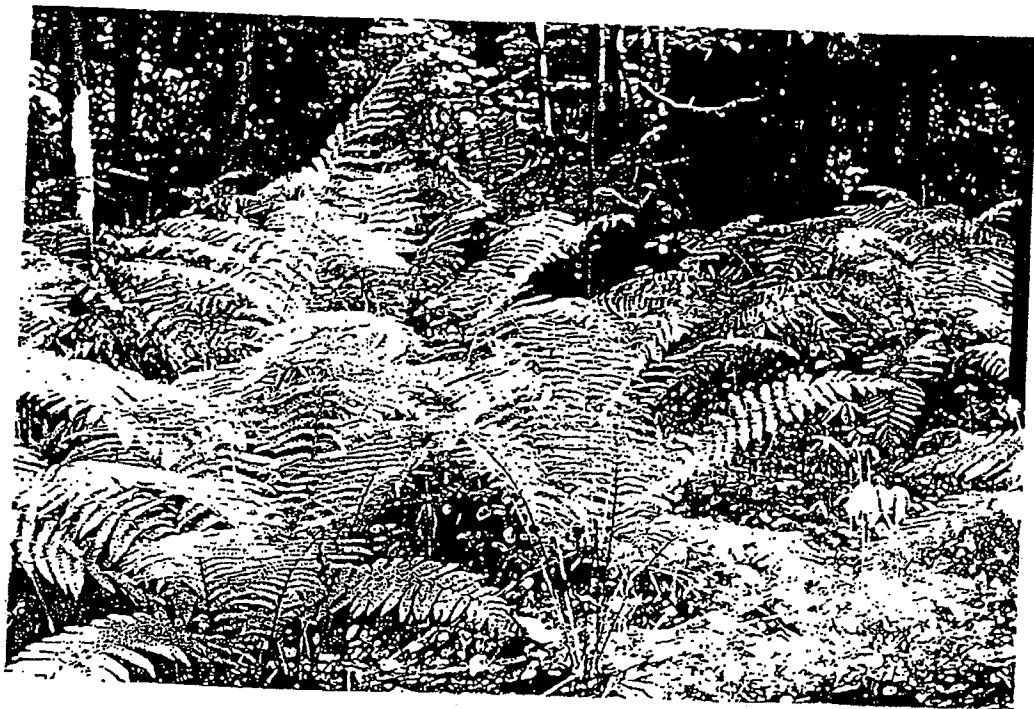
PB



PA - Lilly-of-the-Valley (*Convallaria*)
An old time gardn favorite that
has escaped into the preserve
where there are at least two size-
able beds. They prefer fertile
soil, abundant humus, moisture
and partial shade.

PB - Seedling Balsm Fir (See page 14.
under SUCCESSION)

PC - Royal Fern (*Osmunda regalis*).
Sphagnum Moss and Red Maple leaves
within the Saw Mill Brook Preserve
marsh.



PA - Purple Nightshade
(*Solanum dulcamara*)
A vine like plant that
can be found in the
moist thickets at the
Saw Mill Brook marsh.

PB - When I was explor-
ing the Saw Mill Brook
Marsh I noticed many
butterflies including
several blue and yellow
swallowtails. Here a
specie unknown to me
is perched on Blue
Vetch (*Vicia cracca*)

PC - A glade of Cinn-
amon Fern (*Osmunda*
cinnamomea) just prior
to frost.

American Beech (*fagus grandifolia*) in fall color west of Saw Mill Brook.

Handsome bark when contrasted with hemlock. Retains leaves into winter. Sweet, edible nuts are a valuable food for wildlife.



— Sheep Laurel or Lambkill (*Kalmia angustifolia*)
Evergreen foliage
Plants are poisonous to livestock. Likes moist open places in or near swamps, bogs or wet places in the woods. Sometimes it will be found on moist rocky slopes. This specimen is growing at the edge of the marsh at Saw Mill Brook.



Northern Arrowwood
Viburnum recognitum
 Fall color
 Saw Mill Brook
 Conservation Area
 Along edge of marsh



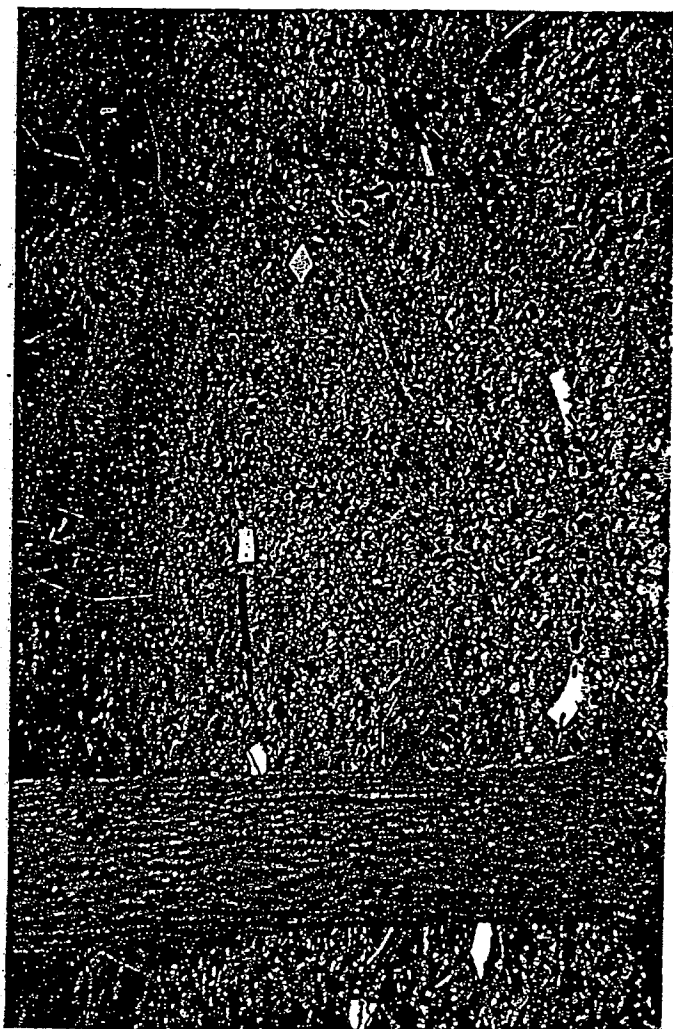
Highbush Cranberry (*Viburnum trilobum*)
 Rare at Saw Mill Brook marsh



Purple Chokeberry
 (*Pyrus melanocarpa*)
 Arrowwood in back-
 ground.



PA/PB - Circular depression containing a few hand made bricks and nails. Nearby is a fieldstone well. Could this site be of historical significance ?





RATTLESNAKE PLANTAIN

EDISON TRACT

SAW MILL BROOK CONSERVATION AREA

RECOMMENDATIONS

When I first visited the Saw Mill Brook Conservation Area it was immediately apparent that this conservation preserve should be classified as a quiet, passive-use mill stream woodland, a special place of solitude and relaxation that is basically unchanged since the glacier shaped the conical knolls and arranged the impressive display of "pudding stone" boulders. In order to further protect and enhance this beautiful fragment of rural Newton and to manage it in a way that encourages a mosaic of plant communities and wildlife habitats while leading the visitor into a worthwhile outdoor recreational and educational experience I recommend the following:

1. EDISON TRACT AQUISITION

There is absolutely no doubt in my mind whatsoever that the natural integrity of the Saw Mill Brook Conservation Area is solely dependent upon the preservation of the Edison tract in its present natural state. When I first visited the preserve I thought the Edison tract was a part of the conservation area. I was stunned when I realized it was not for the forested, conical knolls on the Edison tract are strategically located in such a way as to hold a commanding position overlooking the Saw Mill Brook preserve. In Newton today few, if any open space acquisitions would be of more importance than the outright acquisition of the Edison parcel.

On the Edison parcel there are interesting historical features (see page 19 of this resource study) also one of Newton's rarest plants; the evergreen Rattlesnake Plantain (*Goodyera pubescens*), (page 21).

2. ENTRANCE GATE STATEMENT

I recommend entrances that are inviting and reflect from the outset the natural beauty and environmental quality of this outstanding natural area. This can be accomplished by installing two granite entrance posts similar in size and design to the granite post illustrated on page 20 of the Dolan Pond Conservation Area resource study. To set off the entrance posts as well as enhancing the park statement an informal bed of American Holly (*Ilex opaca*), Rosebay Rhododendron (*Rhododendron maximum*), Mountain Laurel (*Kalmia latifolia*), Winterberry (*Ilex verticillata*), Inkberry (*Ilex glabra*), Red-osier Dogwood (*Cornus stolonifera*), Flowering Dogwood (*Cornus florida*), Azalea species and naturalized bulbs such as daffodils and crocus could be massed behind and to the side of the posts. Behind the entrance mass there would be a weather resistant (boxed) sign post that illustrates the trail(s) and prominent natural features.

3. SELECTIVE PRUNING TO CREATE SELECTIVE VISTAS

There are two or three locations along the existing footpath where selective pruning would open vistas into distant marshy glades. Opening vistas would increase chances for wildlife observation as well as increasing the preserves aesthetic appeal at all seasons. Opening vistas from afar allows visitors to view wildlife from afar without disrupting wildlife.

4. PLANT COMMUNITY CONTROL

Adjacent to the existing footpath there is a small "clearing" where there are several tall Red Cedar which are being over-topped by oaks. The relatively small Red Cedar clearing is a pleasant break in the dominant oak woodland but the sunshine, which Red Cedars must have to survive, is being closed out by the oaks. I recommend removing a few of the young oaks and other saplings in the vicinity of the Red Cedars. This type of vegetation control would contribute in maintaining a mosaic of plant communities which I discussed at length in the Dolan Pond Conservation Area resource study (see pages 11 & 13).

Historically the Red Cedar/turf beneath environment was common over large areas at the turn of the 20th century. Red Cedar are one of the few plants that are able to germinate in thicketurf. Their existence at the Saw Mill Brook preserve is a clue indicating that the area was pasture prior to 1900.

Red Cedar grow increasingly beautiful with age. Here they are near the northern fringe of their range and do not grow very tall but they may live several hundred years and attain girths from six to ten feet. The thick coniferous foliage provides nighttime cover as well as concealment for nesting. Some birds eat the small bluish fruit.

5. TREE APPRECIATION/PHOTOGRAPHIC RECORD

I recommend mapping and measuring the preserves older trees as well as establishing a photographic record of the preserves present stage in postagricultural succession. This would require a structured plan that might inspire citizen interest and input. When large trees are photographed for the record it is helpful to have someone stand next to the tree in order to maintain size perspective. Newton's natural preserves are only now in the elementary stages of postagricultural succession. Two hundred years from now succession will still be in progress. Nature can severely alter natural succession through catastrophic forces such as fire, wind, insect, flood, freezing rain and heavy, wet snow. Recently a small fire burned a small area at the Saw Mill Brook preserve. Did the burn alter the succession cycle in the burn area as compared to the untouched woodland adjacent? If so how? There are many fundamentally pertinent and interesting questions that can be raised regarding even a small natural preserve in Newton. Many of the questions are little different than studies and questions revolving about vast state and federal open spaces. I refer the reader to the section on TREE APPRECIATION in the Kennard Conservation Area resource study (see pages 20 & 21).

6. I recommend limited vegetational control in the small Saw Mill Brook preserve marshes. This control would be almost solely removal of sapling Red Maple so that the marshes will not evolve into rather sterile maple swamp. At this time the small sun flooded marshes are alive with birds and insects. If the red maples overtop the marsh areas the vibrant wildlife habitat will be extinguished. For further discussion see page 11 of the Dolan Pond Conservation Area resource study where MAINTAINING THE MOSAIC OF PLANT COMMUNITIES is discussed at length.

7. EXISTING AND PROPOSED TRAILS

This recommendation is presented on pages 4 and 5 of this resource study.

8. INTRODUCTION OF VANISHED WILDLIFE SPECIES

Eventually a program involving citizens could be instituted for the introduction of native wildflower species that were forced out of Newton during the agricultural expansion of the 18th and 19th centuries. A few species that could be introduced are the Pink Ladys Slipper, Blue Vervain, Cardinal Flower, Marsh Marigold or Cowslip, Turks-cap-Lily, Columbine, etc.

9. I recommend introducing a program that would inspire citizen interest, input and support for their conservation areas. This must involve the educational process through illustrated talks, on-site guided walks and by way of handouts or brochures that are carefully organized with interesting details and possibilities.

10. CONIFEROUS UNDERPLANTINGS

In order to enhance the beauty of the Saw Mill Brook Conservation Area woodland coniferous trees such as Canadian Hemlock (*Tsuga canadensis*), Carolina Hemlock (*Tsuga caroliniana*) and Paper or White Birch (*Betula papyrifera*) could be introduced beneath the dominant oak forest. Along the Lagrange Street side of the preserve conifers might aid in reducing traffic noise as well as screening. The dark evergreen coloring in the background would enhance fall color contrast from the footpath. White Birch are always beautiful at any season. If the Edison tract were acquired groups of hemlock, spruce, fir and White Birch scattered along the conical knolls would dramatically enhance the preserves overall beauty.

On page 24 of this resource study there is an illustration on which I have indicated possible areas for underplanting. There are nurseries such as Western Maine Nursery in Fryeburg, Maine where seedlings of various sizes can be purchased for very little.

RECOMMENDATIONS

See #10 Conifer Underplantings

Yellow coloring suggests areas where underplanting would tend to enhance the woodland beauty.

